Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL. 57, No. 1, JANUARY 1988
Actually 1989

FORWARD TO THE 21ST CENTURY

KENWOOD

AMATEUR LINE-UP

Kenwood's amateur lineup for 1988 incorporates the latest developments in communications technology.

Superior front end specifications are accompanied by the latest developments in transmitter design. Automatic antenna tuning and advanced digital & microprocessor technology make these the easiest to operate Kenwoods ever.

Personal computer control is available on several models.

HF

TS-940S

Competition Quality HF Transceiver. Transmitter: SSB, CW, AM, FM and FSK. 160-10 metres bands. Output 250W PEP. Automatic antenna tuner. Receiver: 150kHz-30MHz continuous. 40 memories, programmable and band scans. Power requirement: 240VAC, 50-60Hz.

TS-440S

Compact HF Transceiver. Transmitter: SSB/CW/FM/AFSK. 160-10 metre bands. Output 200W PEP. Optional automatic antenna tuner. Receiver: 100kHz-30MHz continuous. Power requirement: 12-16VDC 20A max.

1.8-50MHz

TS-680S

High performance HF & 6 metre Transceiver. Transmitter: SSB/CW, AM and FM modes. 160-6 metre bands. Output 100W PEP. (160-10m) 10W (6m). Receiver: 500kHz-30MHz continuous. Memory scan/band scan. Power req: 12-16VDC 20A max.

VHF UHF

TR-751A
TR-851A

All-mode Transceivers. Frequency Range: TR-751A: 144-148MHz, TR-851A: 430-440MHz. Transmitter: SSB/CW/FM modes. Output: 25W. Receiver sensitivity: less than 0.11uV (TR-851A). Features include: Auto-mode selection, dual digital VFOs, 10 memories plus "COM" channel. Optional Digital Channel Link System. Power req: 13.8V ±15% 7.5A max.

TH-25A
TH-45A

FM Handheld Transceivers. Frequency range: TH-25: 144-148MHz, TH-45: 430-440MHz. Output: 5W. Receiver sensitivity: less than 0.16uV (TR-25). 14 multi-function memories, memory scan and band scan. Power req: 6.0-16VDC/1.2A max.

TS-711A
TS-811A

All-mode Transceivers. Transmitters modes: SSB/CW/FM. Frequency range: TS-711: 144-148MHz, TS-811: 430-440MHz. Output: 25W. Receiver sensitivity: less than 0.2uV (TS-811). Features include: 40 multi-function memories, programmable band scan and memory scan plus programmable memory channel lockout. Power req: 240VAC, 13.8V DC/8.0A max.

TM-221
TM-421

FM Mobile Transceivers. Transmitters: Frequency range: 144-148MHz (TR221), 430-440MHz (TR-421). Output: 45W (TM-221), 35W (TM-421). Low power switch to 5W. Receiver: Frequency Range: 130-173.995MHz (TR-221), 438-449.995MHz (TR421). Sensitivity: less than 0.16uV. Power requirements: 13.8VDC ±15%/9.5A max.

TH-215A
TH-415A

FM Handheld Transceivers. Transmitters: Frequency Range: 144-148MHz (TH-215), 430-440MHz (TH-415). Output: 5W/0.5W (Hi/low). Receiver: 141-163MHz (TH-215), 430-440MHz. Scan modes include: band, memory and programmable band scans with 3 scan stop modes. Power requirements: 7.2-16V/2.0A max.

VHF/UHF DUAL BANDER

TM-721A

NEW

Dual band FM Transceiver with across band duplex. New for 1988, with dual watch, selectable full duplex cross band operation, automatic band change, 30 memory channels. Transmitter: Frequency Range: 144-148MHz/430-440MHz. Output: 45W (VHF) 35W (UHF). Receiver sensitivity: 0.16uV (UHF).

RECEIVERS

R-5000

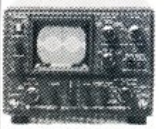
Communications Receiver. The R-5000 is a competition class communications receiver. It receives all modes (SSB, CW, AM, FM, FSK). Frequency coverage is 100kHz to 30MHz in 30 bands. Selectable IF filters and dual-mode noise blanking are incorporated. Power requirements: 240VAC or 13.8V DC.

RZ-1

Wide Band Receiver. The RZ-1 covers 500kHz-905MHz. Features include: AM and FM reception, 100 easy to operate multi-function memory channels. Scan modes include VFO scan and memory scan plus programmable channel lockout. Power requirements: 11-16V DC/1A max.

MISC.

STATION MONITOR



SM-220

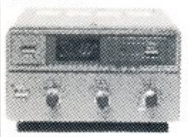
Based on a wide-frequency range oscilloscope, it combines a two tone generator, a wide variety of waveform observing capabilities.

HF LINEAR AMPLIFIER

TL922

A class AB$_2$ grounded-grid linear amplifier. Covers 160-10m for SSB, CW and RTTY modes. Drive Power: 80W for full output. RF Input Power: 2,000W PEP (SSB).

ANTENNA TUNER



AT-250

Optional automatic antenna tuner for the TS-680S. Features full coverage of 160-10 metres. Insertion loss: less than 0.8dB. Through power: 150W.

REMOTE CONTROL HANDSET

RC-10

Connects to models TM-221, TM-421, TM-721. Provides all functions on the front panel. Will link together models TM-221/TM-421.

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

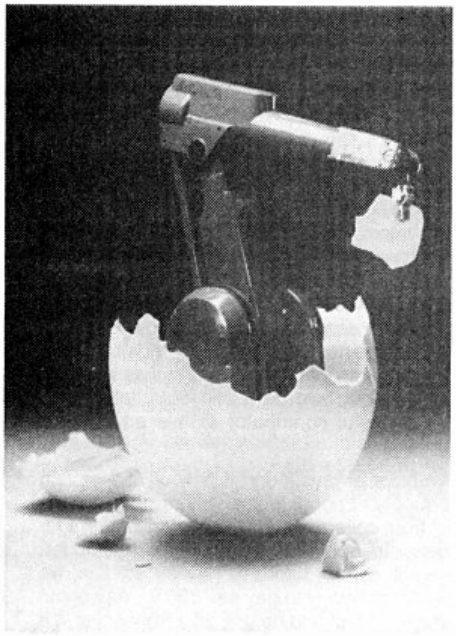
4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W., 2066. Ph. (02) 428 1455.

YOUR AUTHORISED KENWOOD DEALER, BELOW, WILL GUARANTEE SATISFACTION:

Further, beware of dealers not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Australia Pty. Ltd. and have no guarantees applicable.

NSW: Sydney, Emtronics (02) 211 0988. **Parramatta,** Captain Communications (02) 633 4333. **Inverell,** Reg Stockman Communications (067) 22 1303. **Cessnock,** Robertson Electronics (049) 90 7908. **Wollongong,** Macelec Pty Ltd (042) 29 1455. **Port Macquarie,** DX Engineering (065) 84 9922. **Lismore,** Frank Boundy (066) 86 2145. **ACT:** O'Connor, Alex Johnson (062) 47 9125. **VIC:** Moorabbin, Measure-Tech Supplies Pty Ltd (03)553 4566. **Melbourne,** Emtronics (03) 670 0330. **Ballarat,** Brian Stares (053) 39 2808. **Bendigo,** Sumner Electronics (054) 43 1977. **TAS: Hobart,** Watsons Wireless (002) 34 4303. **Launceston,** Marine & Communication (003) 31 2711. **Burnie,** V.K. Electronics (004) 31 7733. **QLD: Albion,** Mitchell Radio Co. (07) 357 6830. **Brisbane,** Emtronics (07) 394 2555. **SA & NT: Port Adelaide,** International Communications Systems Pty Ltd (08) 47 3688. **WA: Victoria Park,** Willis Electronics (09) 470 1118. **Ferndale,** Bay Radio (09) 451 3561. **Osborne Park,** Ford Electronics (09) 242 1766.

Amateur Radio



Future Technology towards the 21st Century. How will our hobby contribute?

Special Features

Technical Features

Regular Features

DEADLINE

All copy for inclusion in the March 1989 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, January 20, 1988.

PROUDLY PRINTED IN AUSTRALIA

Amateur Radio

Published monthly as the Official Journal by the Wireless Institute of Australia, founded 1910. ISSN 0002 — 6859. Registered Office: 3/105 Hawthorn Road, Caulfield North, Vic. 3161. Telephone: (03) 528 5962.

Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162,** by the 20th day of the second month preceding publication. **Note:** Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. **Phone: (03) 528 5962.** HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

Production: BETKEN PRODUCTIONS
5 Masefield Avenue, Mooroolbark, Vic. 3138.
FAX:(03) 725 0490
Combined Colour Separations by: COMBINED REPRO GRAPHICS
3/35 Malvern Street, Bayswater, Vic. 3158.
Tel:(03) 729 4344
Typesetting by: BETKEN PRODUCTIONS
5 Masefield Avenue, Mooroolbark, Vic. 3138.
Make up and Photo Reproduction by: EASTERN ADVERTISING PTY LTD
PO Box 558, Lilydale, Vic. 3140
Tel:(03) 735 5410
Printed by: WESTERNPORT PRINTING PTY LTD
Station Street, Koo-wee-rup, Vic. 3981.
Tel:(059) 97 1888.
Mail Processing by: POLK MAILING COMPANY PTY LTD
PO Box 140, Collingwood, Vic. 3066.
Tel:(03) 417 5161
Opinions expressed by individuals are not necessarily those of the Wireless Institute of Australia.

Editor's Comment

ANOTHER NEW YEAR

After all the Bicentennial frenzy of 1988, welcome to 1989! There seems to be nothing much to distinguish it at this early stage. No Bicentennial, no Olympic Games, not a Leap Year; just your undistinguished run-of-the-mill common or garden year. No Region 3 Conference, no WARC (but let's not forget that we're a year closer to the next, in 1992 or 1993, and after that amateur radio may never be the same again!).

When I became Editor of AR in 1984 the magazine production had already been in the capable hands of Betken Productions for two years. Not only does this issue very nearly complete six years of service by Betken, but it is also their last. The WIA will not easily find alternatives, and I would like to record here our gratitude to Ken and Bett for the tremendous job they have done over the years.

As a result of this change in our circumstances, two things are virtually certain. There will be a great deal more work to be done by the Publications Committee and by the already heavily overloaded Executive Office, *or* (But more likely *and*) the magazine costs will rise significantly. As always, our aim will still be to bring you the best magazine we can all afford, but some changes may be forced upon us. There may also be a few problems in maintaining present production schedules. Time will tell.

One feature of *Amateur Radio* which does not change is that you, the readers, continue to find technical articles the most interesting part of the magazine. This means that we are critically dependent on you, the writers, to maintain the supply of good, readable, educational and/or useful articles. They need not be technical "blockbusters" or deal only with the latest state-of-the-art fringe-of-the-field! Much of what seems second nature to some of us old timers is often basic knowledge of which newcomers may not yet be aware. It never ceases to amaze me how students these days need to learn more and more than their parents ever knew, and in less and less time! In our own particular field, let's make AR a useful contributor to this educational process.

We have always found it difficult to maintain a supply of good, topical colour photographs for front covers. Words like *last-minute, hand-to-mouth,* and *panic* spring to mind! Although we still cannot afford to pay for articles, we would be happy to pay say $50 for any photo which we can and do use on a front cover, if it is relevant to an accompanying article. Transparencies, preferably at a choice of two or three different exposures, are needed. Black and white photos for use on internal pages to support the same article will earn an additional fee of $10.

Well, there it is. January 1989. Doesn't look too auspicious at this stage, does it? Perhaps, viewed in retrospect from 1990, it may prove to have been an epic year. In hope, may we all have a Happy New Year!

Bill Rice VK3ABP
Editor

ar

SUBSCRIPTION REMINDER NOTICES

As from now, only one membership subscription notice will be forwarded to members each year.

A reminder notice will not be sent!

As from now, only one additional issue of *Amateur Radio* magazine will be sent to you if your renewal subscription is not received.

Not two additional issues as in the past!

Only a small number of *Amateur Radio* magazines are now being printed each month surplus to members requirements. This means that if you do not renew your subscription on time, you may not be able to get your missing copies of AR!

WHEN YOUR MEMBERSHIP RENEWAL IS DUE, PLEASE PAY PROMPTLY AND ENSURE CONTINUAL RECEIPT OF *AMATEUR RADIO* MAGAZINE!

ar

Alan Shawsmith VK4SS
HISTORIAN FOR THE QUEENSLAND WIA DIVISION
35 Whynot Street, Westend, Qld. 4101

The operation of station VI88XPO, in Brisbane, during the period April 30 to October 30, 1988, as part of the Expo World Fair, was a significant history-making event for Queensland amateur radio — and not likely to be repeated in the foreseeable future. As luck would have it, 1988 was also Australia's Bicentennial Year: hence the figure '88' in the dual purpose call sign.

As all Australia and the world now know, Expo 88 was an outstanding success. Local and foreign visitors, and consequently the dollar profit, exceeded all expectations. The number from overseas, who were enticed here by the activity of VI88XPO, is obviously not known but an educated guess suggests that a contact with VI88XPO would have acted as a catalyst for many a wavering mind.

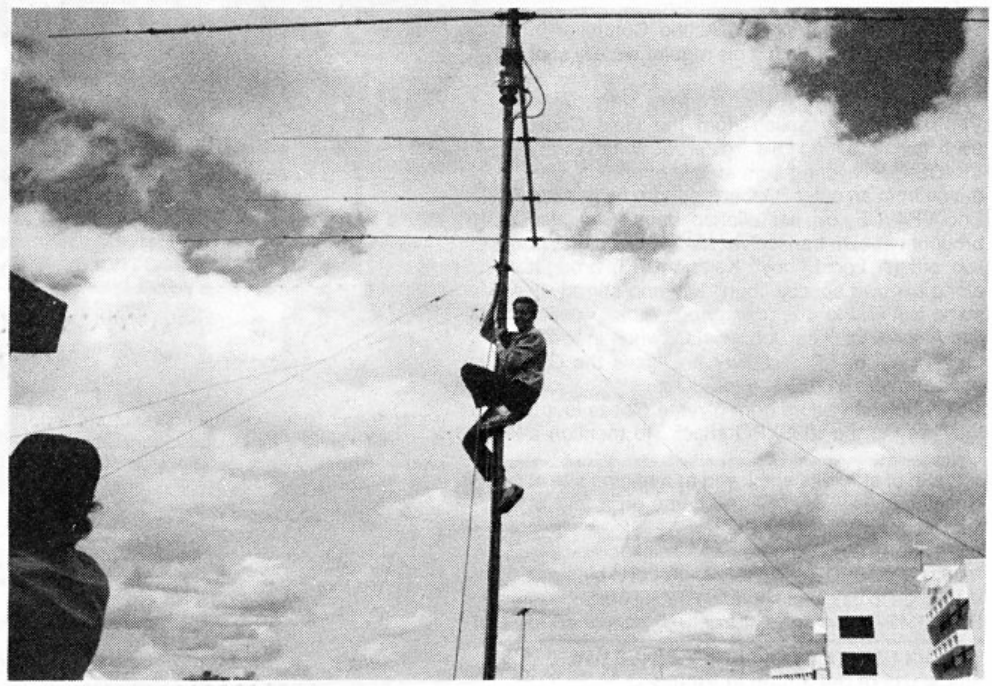
The Expo Authority did not give approval for VI88XPO to be erected on the world site proper. This most unexpected decision was a great blow, especially as it came so late in the planning. For a time it appeared that there would be no VI88XPO operation at all. However, in order to keep faith with amateurs locally and overseas, who were waiting for the World Fair Station to come on air, WIA Queensland President, David Jones VK4NLV, organised a volunteer group of assistants to erect VI88XPO elsewhere. A suitable site was offered at the nearby Technical and Further Education Communications building (TAFE).

Types of equipment used were transceivers FT-101B, TS-530S and TR-4C. These were fed into a TH6DXX beam and a G5RV for 80 and 40 metres. As always happens, the uninvited guest Murphy "gate-crashed" the scene. Erecting the beam posed problems. A TH6DXX plus rotator is not a lightweight structure and needs to be stood on a solid base. This latter was lacking, however, due to an "antenna party" comprising Hans Huber (TAFE Technical Officer), Eric VK4NEF, Rick VK4NMA, Harvey VK4AHW, Bruce VK4AMV, David VK4NLV and Eddie VK4ABX, the array was eventually put in place.

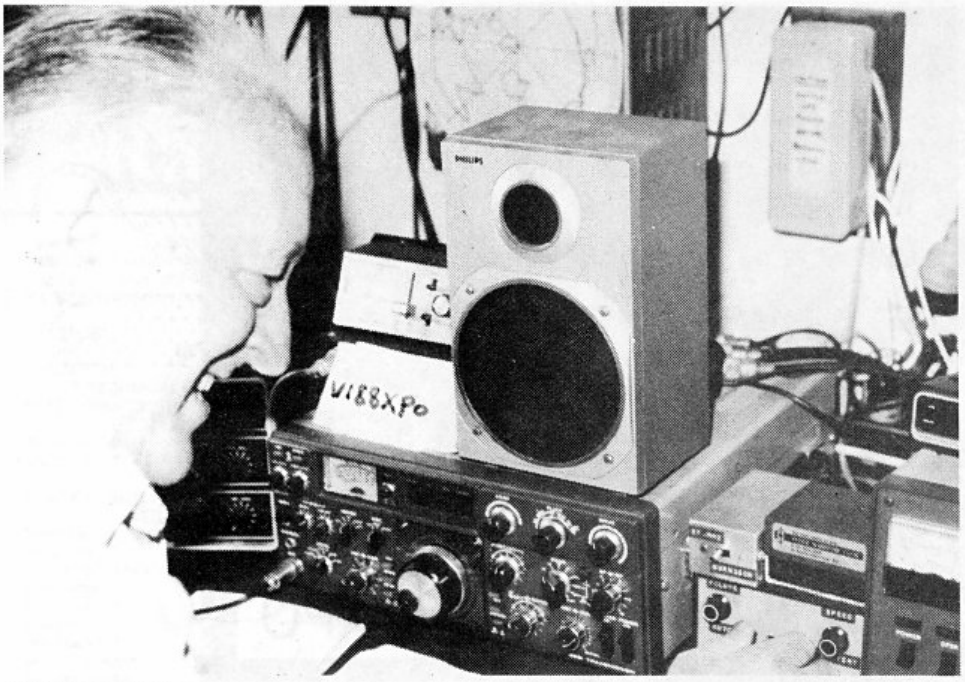
The honour of making the first VI88XPO QSO was given to this writer (VK4SS), and the station worked was JA4MZL, at 0001 UTC, April 30, 1988 on 21 MHz CW. This was followed by XE2AQ, at 0002 UTC. During the next five hours 300 contacts were made. After this, VK4SS was then rostered on the after-midnight shift, mostly 14 MHz CW. Operation was from my own shack only 500 metres from and overlooking the World Fair site. (Personally, I enjoyed every minute of the "pile-ups" than ensued).

The TAFE Communications building was open from 8 am to 9 pm, the World Fair from 10 am to 10 pm. Unfortunately, continuous 12-hour operation by VI88XPO was impossible as the majority of amateurs who would have given their time willingly were busy at their places of employment. Even so, the station was quite active. Below is a list of those who did their bit unselfishly to keep the station on the air. Most operated from the TAFE site but a few from their own QTHs.

VK4ABF, Kev VK4KTF, Val VK4VR, Eddie VK4ABX, Eric VK4NEF, Don VK4YI, Geoff VK4AG, Bob VK4NFE, Tom VK4ZAL, Aaron VK4AHO, Peter VK4NGK, Jim VK4ZML, Bruce VK4AMV, Mike VK4NHF, Guy VK4ZXZ, Anne VK4ANN, VK4NJQ, Bob VK4LG (CW), Roy VK4BAY, David VK4NLV, Bill VK4MWZ (CW), Noel VK4BIF, Rick VK4NMA, Alan VK4SS (CW), John VK4BKC, Tom VK4OD, Laurie VK4BLE, Pam VK4PAM, Keith VK4TT (CW), Bob VK4CE,



The beam is up and guyed. David VK4NLV adjusts the guy tension whilst Eric VK4NEF unties the rope used to raise/tilt the antenna to an operating position.



Alan VK4SS, sets his programmable keyer for some high speed QSOs (and a "pile-up"?).

VK4RL (RTTY), Rus VK4XA (CW), Cathy VK4CEK, Alex VK4RU, Peter VK2SJ, Lee VK4CXX, Eric VK4VCE, Merv VK4DV, Geoff VK4VLI, Gus VK4GUS/VE7GUS, Marshall VK2DBS/4/WA6PRE.

A special word of thanks is due to the following:

1. Hans Huber, TAFE Technical Communications, who was always available to "trouble-shoot" the station during its period of operation.
2. TAFE Amateur Radio Club, VK4AAM, for the use of their premises.
3. David Jones VK4NLV, WIA Queensland President, who co-ordinated the original volunteers.
4. Eric Fittock VK4NEF, Roster Control and a non-stop, do everything work horse. His QSO tally exceeded 3000.
5. Roy Mahoney VK4BAY, Acting Controller in Eric's absence. He did his regular weekly stint on air, right to the end.

A few others who were rostered were, John VK4BKC, who travelled from the Gold Coast each week to do his rostered shift. Cathy VK4CEK, recovering from an eye operation, was driven from an outer Brisbane suburb by her son Eric VK4VCE, on her allotted days. She also brought her own transceiver along, as did one or two others. Local "boy" Keith VK4TT, brought along his own special "bug" key and stirred up some fast CW for the quicker operators. Australian Airlines Captain Bob VK4LG, when in town, brought his own transceiver and gave the CW boys and girls a QSO.

A variety of visitors from diverse places found their way to the VI88XPO shack. To mention a few:

A group of students employed at a mining site at Nhulunbuy, in Arnhem Land came on a tour of inspection.

A US citizen and globe-trotting fossicker.

Marshall WA6PRE/VK2DBS/4, dropped by more than once to talk to his buddies back home.

Roy VK4BAY, (no sched arranged) happened to work Marshall after his return to Fresno California, and brought him up-to-date on events.

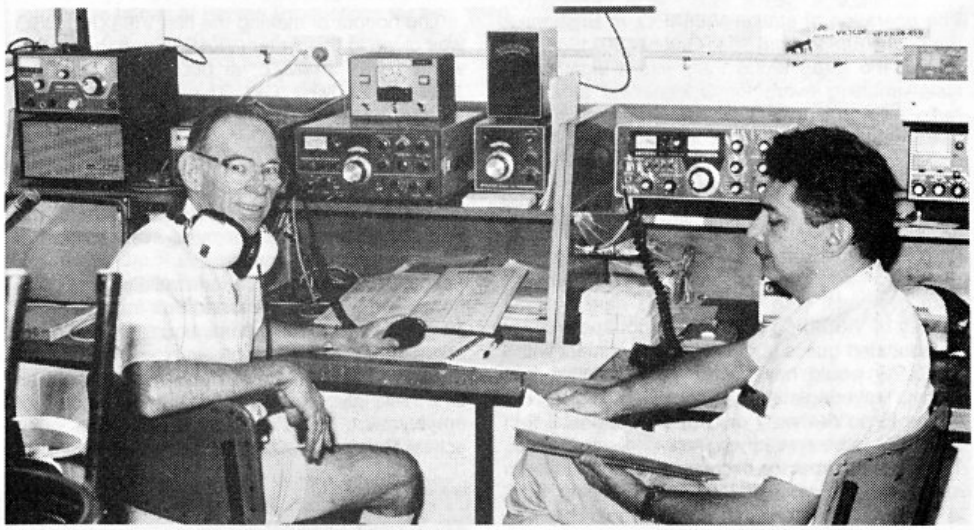
Serge RA3AJD, a technician at the Russian Expo Pavilion, accompanied by a friend had fun working his compatriots in UA-land in his native tongue.

No comment on VI88XPO could be complete without an acknowledgment of gratitude to the understanding partners of all those who participated in the operation. It is certain that domestic chores were often put aside so that the station be kept on the air.

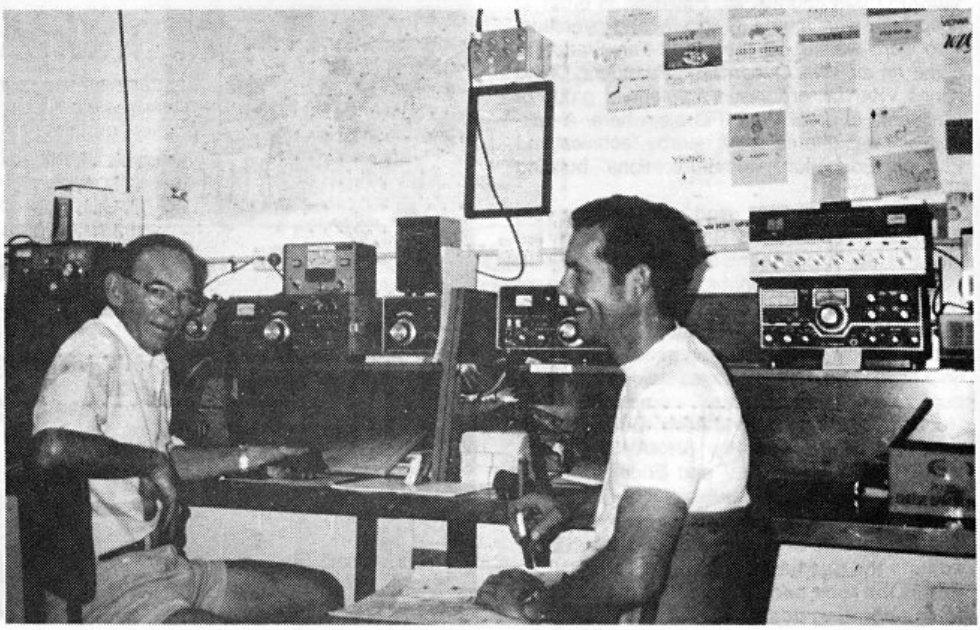
Eric VK4NEF, deservedly made the last VI88XPO QSO at 2400 UTC, 28 MHz SSB on October 30, 1988. Final detailed figures are not yet available at this time of writing — but a conservative estimate shows that 15 000 QSOs with 150 countries on five bands were accomplished and many friendships cemented in the process.

The Expo Authority adopted as the World Fair's theme, "Leisure in the Age of Technology". Could any activity personify this phrase better than amateur radio? Even so, it wasn't enough to influence the profit-minded decision makers.

ar



Roy VK4BAY (left) and Hans Huber TAFE Technical Officer.

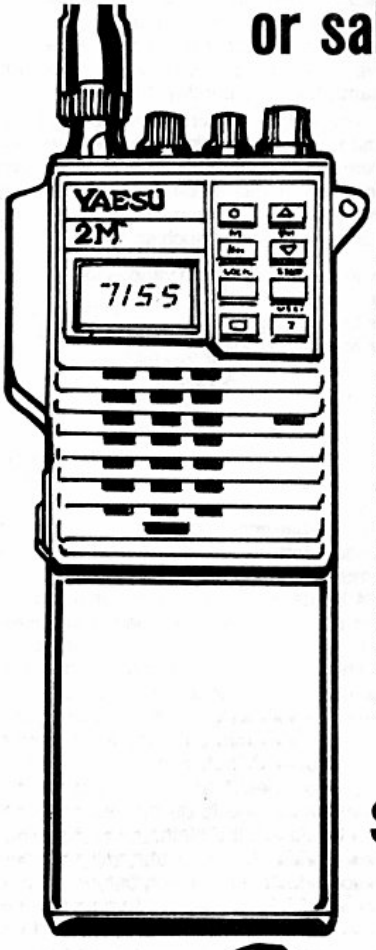


Roy VK4BAY (left) and Eric VK4NEF, two stalwarts of the action at VI88XPO.

JUST 2

of the great, money saving reasons most amateurs shop at Dick Smith Electronics. When it comes to selection, price or sales and service back-up — there's nowhere else to go!

YAESU



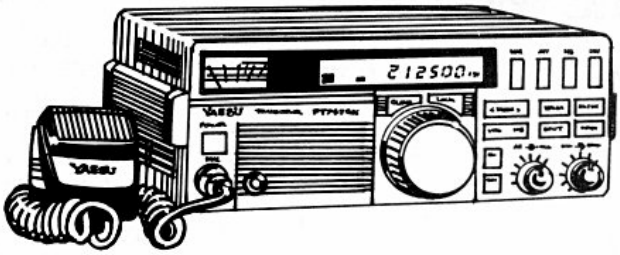
Big Performance From A Tiny Hand-Held!

The ideal 2m for the novice . . . or anyone wanting the best in hand-held performance. A tiny 55mm × 32mm × 139mm, yet Yaesu's FT23R is packed with all the most advanced features.

— Look! —

- **Fully microprocessor controlled**
- **Covers 144-148MHz**
- **10 memories**
- **Repeater splits**
- **Busy and priority scanning**
- **Up to 5 Watts output (With optional 12V supply)**
- **S/RF Meter, carry case, antenna — FNB-10 Nicad Battery & more! Cat D-3490**

$469



Budget HF Transceiver

Compact and lightweight so you can even use it as a mobile! The incredible Yaesu FT747GX is specially designed for easy operation, high performance and value for your dollar.

Look what you get ...

- **All HF bands (160 through 10 including WARC)**
- **All Mode (with optional FM)**
- **100 Watt (CW, AM 25W)**
- **Just 238 × 93 × 238mm**
- **Yaesu quality and much more!**

Cat D-2930

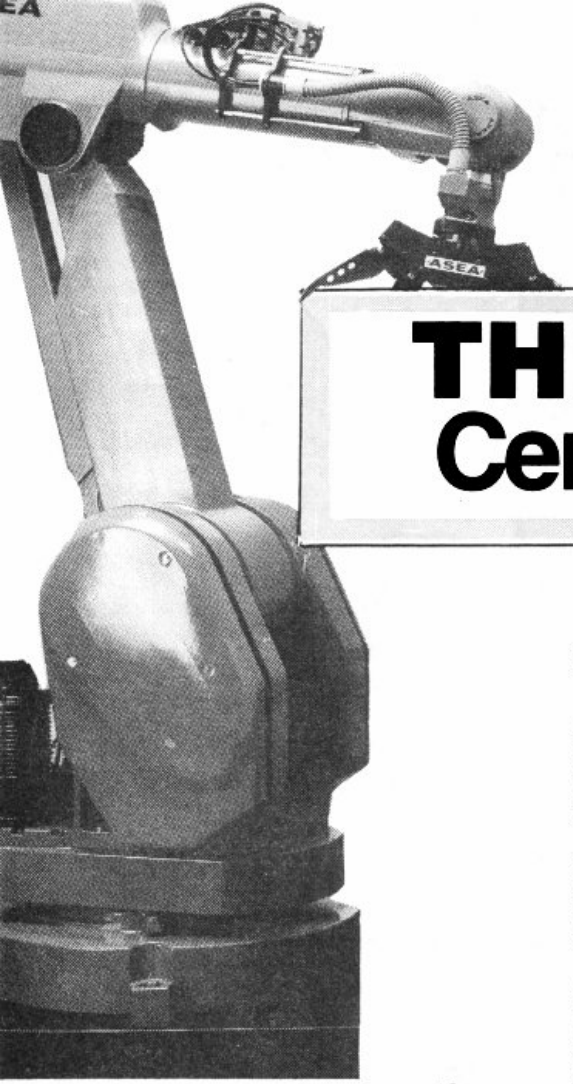
$1395

MIC NOT INCLUDED

DICK SMITH ELECTRONICS

Now available at 60 stores:
• **NSW** • **Albury** *21 8399* • **Bankstown Square** *707 4888* • **Blacktown** *671 7722* • **Bondi Junction** *387 1444* • **Brookvale** (**Warringah Mall**) *905 0441* • **Campbelltown** *(046)27 2199* • **Chatswood Chase** *411 1955* • **Chullora** *642 8922* • **Gore Hill** *439 5311* • **Gosford** *25 0235* • **Hornsby** *477 6633* • **Liverpool** *600 9888* • **Maitland** *33 7866* • **Miranda** *525 2722* • **Newcastle** *61 1896* • **North Ryde** *88 3855* • **Parramatta** *689 2188* • **Penrith** *(047)32 3400* • **Railway Square** *211 3777* • **Sydney City** *267 9111* • **Tamworth** *66 1711* • **Wollongong** *28 3800* • **ACT** • **Fyshwick** *80 4944* • **VIC** • **Ballarat** *31 5433* • **Bendigo** *43 0388* • **Box Hill** *890 0699* • **Coburg** *383 4455* • **Dandenong** *794 9377* • **East Brighton** *592 2366* • **Essendon** *379 7444* • **Footscray** *689 2055* • **Frankston** *783 9144* • **Geelong** *43 8804* • **Melbourne City** *326 6088* • **Richmond** *428 1614* • **Ringwood** *879 5338* • **Springvale** *547 0522* • **QLD** • **Brisbane City** *229 9377* • **Buranda** *391 6233* • **Cairns** *311 515* • **Chermside** *359 6255* • **Redbank** *288 5599* • **Rockhampton** *27 9644* • **Southport** *32 9863* • **Toowoomba** *38 4300* • **Townsville** *72 5722* • **Underwood** *341 0844* • **SA** • **Adelaide City** *232 1200* • **Beverley** *347 1900* • **St. Marys** *277 8977* • **Elizabeth** *255 6099* • **Enfield** *260 6088* • **WA** • **Cannington** *451 8666* • **Fremantle** *335 9733* • **North Perth** *328 6944* • **Perth City** *481 3261* • **TAS** • **Hobart** *31 0800* • **NT** • **Stuart Park** *81 1977*

DSXpress order line 008 22 6610



THE ROBOT — 21st Century Technology

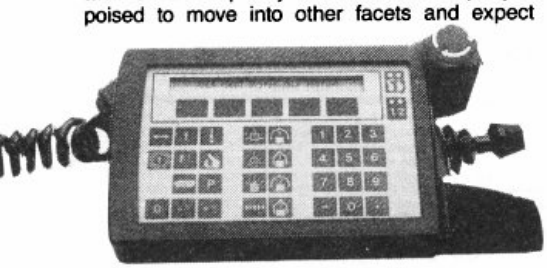
Ken McLachlan VK3AH
PO Box 39, Mooroolbark, Vic. 3138

Fourteen years ago saw the world's first installation of an electronic industrial robot.

Since that time many thousands have been manufactured throughout the world, performing various menial tasks in those early days, gradually increasing to the ultimate in precision during this decade.

Many will comment that the use of robots is creating less work for individuals entering or attempting to enter the work force and it has been argued by the Managing Director and founder of the company operating under the name Voxson, Mr Lucas Longginou. Earlier this decade the headquarters of the company was moved to sunny Queensland, making radios for motor vehicles.

Quality vehicle sound systems became the next step of operations to be placed on the market, being a complete success, home entertainment units quickly followed. The company is poised to move into other facets and expect sales of $50 million in 1989 and $300 million by 1991.



ASEA Brown Boveri Patented Teaching Pendant with Joy Stick.

Mr Longginou, according to an article in *PROFIT'*, visualises vast extensions to their operations and the introduction of the use of robots which contrary to popular belief, wouldn't do away with jobs in Australia, but increase them.

The article states that jobs, now located in foreign countries will be brought to within our country. Introduction will in fact create more employment of technicians, engineers, sales, marketing and distribution personnel.

According to other recent media reports, Australia has approximately nearly a thousand robots installed in various environments. The Ford Motor Company is believed to have in the order of 200 units operating in its two Victorian factories located at Broadmeadows and Geelong. Our country's quantity of machined and programmed 'workman' is infinitesimal to those in use by our northern neighbours.

Management and workers alike have quickly seen the benefits, particularly in industrial environments where moving heavy weights, using hazardous equipment and breathing noxious fumes has produced better quality control, higher productivity, less absenteeism with the spin off to the workers being employed in more interesting productive aspects which create a higher degree of job satisfaction, minimising accidents, work related injuries and sickness with the bonus of working less man-hours, allowing more time for leisure, closer family involvement, increasing education and doing what they like to do, which naturally they outshine in, accomplishing it better and quicker. Why? Simply, because they like doing it.

Looking back in history, there was the Industrial Revolution, which was the same period that our country was discovered. After celebrating our Bicentenary last year, we are updating the history books daily with our technological advancements, particularly in the electronics arena.

Robots can be produced to virtually perform any function that ones mind can envisage and the robot is only as good as the program that has been written for the duties which it is intended to perform in many areas that a human couldn't handle such as temperature, scientific and hazardous locational environments to mention a few.

When one looks at some of the specifications that robot manufacturers are offering, the mind boggles. Speeds of up to two and a half metres per second for the handling a 100 kilogram load, with a repeatability factor being better than one tenth of a millimetre. The approximate working area of the largest electronic, electrical and industrial Robot is one and one half metres wide in the vertical plane complimented by a working height of two metres and a rotational axis of 270 degrees in the horizontal plane. It will not complain of temperatures that lie between plus five to 45 degrees Celsius and will work constantly 24 hours per day, if required.

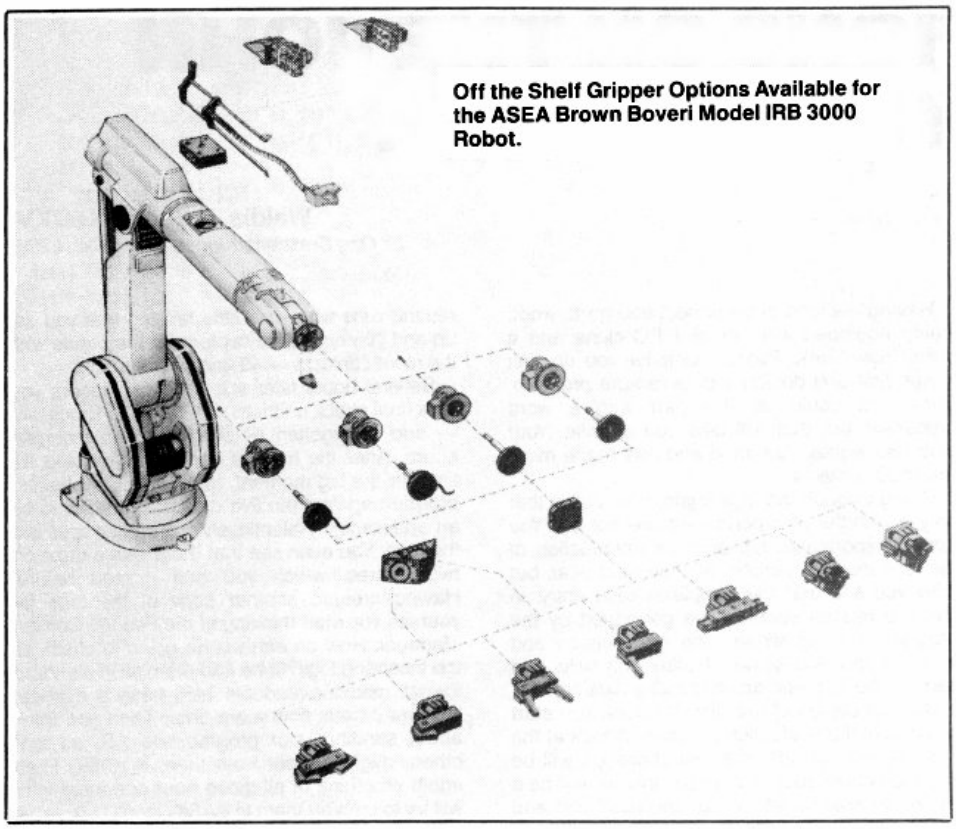
The Robots, which we are going to call Fred and Freda in this article, may receive instructions from a mainframe computer or even to a common 'garden' type 'look-a-like' variety using five and a quarter inch 'floppys'. Its 'fingers' can handle many tasks such as:

- Material handling in various forms.
- Spot welding.
- De-burring.
- Machine tending.
- Spray painting.
- Arc welding.

These tasks are a few applications which may be performed in increments indiscernible to the human eye on over 10 axes. Fred can do anything he is told and work quite harmoniously with his partner Freda. The controlling floppy is divided into 19 blocks which are capable of performing up to 9999 programs. Approximately 164 Kbyte programs can be stored on the disc and automatically down loaded into RAM, thus utilising the 'floppy', as a mass storage.

The Department of Labour and Industry, the 'guru' of factory regulations in Victoria, stipulates the maximum weight of any article a female may lift is 16 kilograms. Freda, when correctly designed doesn't 'huff and puff' at loads like this, she also doesn't ask for a 'smoko' or 'lunch' break whilst she is on an assembly line. Fred and Freda are the Method and Planning Engineers dream. A dream that will snowball into a major industrial revolution before the year 2000, not only in Australia, but throughout the world, even to the yet uninitiated, third world countries. A bonanza of progress and efficiency brought about by the dedication of computer engineers, technicians and suitably instructed supervisory personnel.

According to media reports, Japan has come up with the most innovative 'jockey' yet known. Yes, it is a robot jockey which is providing the answers to the Japanese racing industry's prob-



Off the Shelf Gripper Options Available for the ASEA Brown Boveri Model IRB 3000 Robot.

lem of the lack of jockeys. At the present they are only doing trackwork and the 'jockey' has not to endure stringent diets to make the correct weight. The robot nicknamed Cosmo and all the relations of Cosmo can use reins, whip and spurs which are electronically controlled by a receiver that is actuated by a legitimate jockey, giving instructions on a transmitter. Voice commands usually used in the racing industry are relayed to an attached speaker, of course in the language the horse understands.

There is extreme interest in Japan and other countries in this concept of training horses and maybe eventually using them for racing. The next decade may see a lot of changes in the industry, but how the Australian racing authorities will take to it is another story. Look how long it took the gentlemen of the 'Turf' to recognise and allow the ladies to enter into the profession. In a mixed race, a jockey could say anything to a robot opponent without facing the horror of the stewards wrath. Well for the present anyway!

The amateur is not left out in the cold in this sphere of electronics and even the Honorable Senator Gareth Evans QC, in his address on opening the 1988 Remembrance Day Contest intimated the amateurs assistance in radio, over the years, now it is the time to expand the technological knowledge we have and channel it towards the future. What better avenue than having a hand in a radio-controlled Fred and Freda, from the allied and fastest growing Australian hobby, computers. Let us as a dedicated service organisation, show the professionals that we will not be left behind and can assist with ideas and new concepts in this fast growing and accepted field of technology.

ASEA Brown and Boveri Robotics nine years ago introduced to Australia, Sweden's proven decade of technology for Australian engineers and technicians to build on. The original designers are improving daily the initial concept by having evolved a method of electronically controlling six areas of freedom in the working head and a further three external axes for use on track motion, or manipulators. In one unit, the 'arm' may be twisted, the 'wrist' bent and even swiveled to the nth degree of accuracy in complicated and tedious assembly tasks.

Programming is simple, as plain alphanumeric questions are displayed on the screen, requiring the operator to indicate the response he or she desires by pressing the appropriate key or by manual control of a joy-stick to position the 'fingers' at the desired point for the envisaged operation.

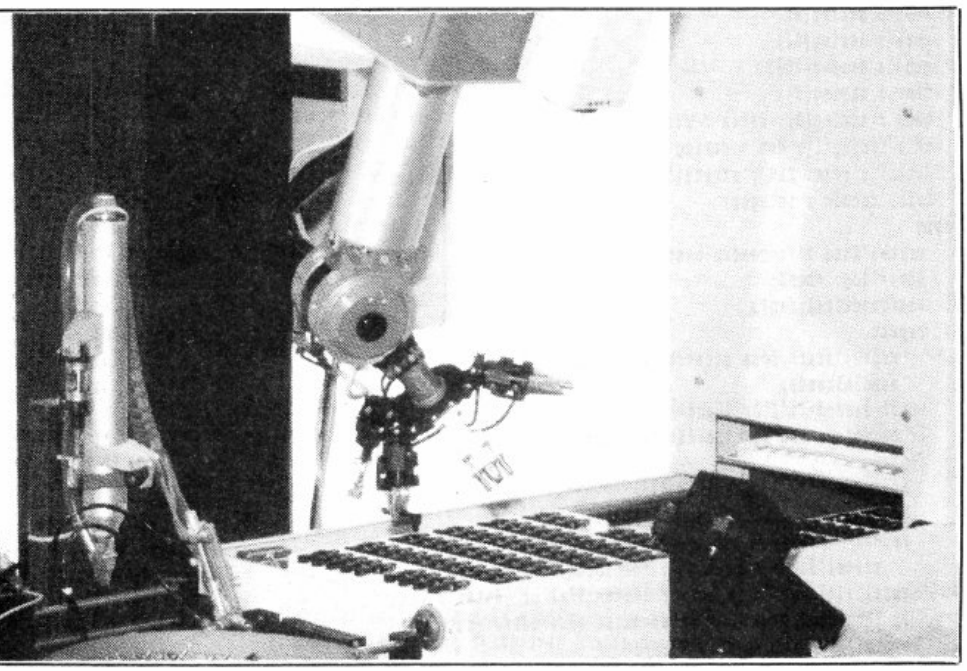
Like all equipment, service is required. As one who uses a car knows that one does not only put petrol in and keep driving but has to check oil, water and a host of other services. Fred and Freda are the same nevertheless, their control unit has a built in diagnostic unit, which advises of faults which may appear from time to time by locating the area or areas responsible. All units are fail safe programmed initially, in the rare case of an equipment malfunction.

Sincere thanks are extended to the Management and staff of ASEA Brown Boveri Robotics, for their assistance and advice in the writing and illustration of this article and also to *PROFIT*, the magazine written and distributed by the Australia wide accounting firm of Coopers and Lybrand.

1. PROFIT June/July 1988: Distributed by Coopers and Lybrand in Australia

ar

Typical Application Example Showing the IRB 1000 Assembly Robot with Multi-Grip Assembling Push-Buttons on a Personal Computer Keyboard.



REFLECTIONS ON THE JOHN MOYLE FIELD DAY

Waldis Jirgens VK2DXV
27 Oag Crescent, Kingswood, NSW. 2750

So you have been chosen to evaluate the John Moyle contest. You have been unable to help with the contest itself, but being the club's computer guru it's your turn to do the logs. You look at them, and straight away you wonder why they let the people with the worst handwriting keep the logs. Just as well. . . you will have to decipher the hieroglyphics. A more thorough look: There are AX stations, to be treated as VK, and then VI88ACT and VI88SA; there is no VI88NSW, so they will be all treated as interstate. Then there is this VK3. ./2 at his holiday home in NSW, sending an I suffix, and another VK3. ./2 being in the bush and sending an F suffix; not to forget the P29 station using the F ending too. A Canadian station sending an I suffix; did they explain the rules to him on air? As usual many portable stations didn't use the /P, or did the logkeeper just omit it, in his wisdom relying on you to put it back in place?

Then you must distinguish between contest and non-contest ZLs for the dupes. Somewhere in the log there are no times marked for five minutes. You warned them before, not to do that, but the five minutes you can interpolate. The VHF log holds a special temptation for stations around 50, 100 or 150 kilometre away. Are you going to be honest and determine the QTH as best you can or will you be tempted to write 101 instead of 99?

Having decided to be honest you go to work. Being equipped with an IBM PC clone and a brand new Turbo Pascal compiler you do first things first and design a data-capture program. Sure, you could do this part with a word processor, but that will take you a while. Your club has worked like mad and has made more than 500 contacts.

Going through the logs again, you realise that only a handful of reports sent are not 59. You think of sportsmanship and the introduction of the less than 90 percent 59 rule next year, but then you see that this simplifies data entry, in that the reports sent can be generated by the program. Having written the first version and tested it you add some whistles and bells and capture the 15 metre and two metre data first.

Backup copies of the diskette done you start thinking of the evaluation program. A look at the rules shows you that the real challenge will be the dupe-check routine whereas the rest will be a piece of cake. So you write "the rest" first and run the 15 and two metre evaluations. The first listing looks a bit scruffy, but the second one is okay. Then you add the dupe-check routine. Being unfamiliar with Pascal you learn about the Div and Mod arithmetic operators as well as about the val function and programming without a 'go to' command. Finally the dupe-check routine runs with your little test-log that you set up and you start data-capture for the bands with the most contacts — 40 and 80 metres.

Several hours later still with sore fingers you do a final check on them with the word processor — add a forgotten /P or change an incorrect figure. After the backup copies are created it's time for the big moment, run the final evaluation program against the live data. It turns out to be an anti-climax. Relentlessly the printer spits out the logs. You even see that there was a dupe on two metres, which you had missed before. Having created another copy of the logs for yourself you start thinking of the Federal Contest Manager. How on earth is he going to check all the incoming logs? If he had them all in standard format machine-readable he'd have a chance. Well may be in five years time! Then you think about sending your programs to AR, so that others might benefit from them in 1989. Then again you think of all those poor operators who will try to convert them to BASIC (don't ! ! !).

Anyway here they are. Some things are hard-coded but they can be changed easily. Some problems may have a simpler solution, but I did not want to spend more time than necessary with them. So all that remains is to wish you good luck and happy contesting.

ar

```
program dacap;
Uses CRT, Turbo3;
var
   call : string[11];
   date : string[1];
   time : string[4];
   sent : string[8];
   rece : string[9];
   qth  : string[20];
   dist : string[3];
   band : string[3]; datsa : string[1];
   ok : string[1]; dsn : string[7];
   datfil : text; ZZZ : string[56]; next : char; ende : boolean;
   sein, cocode : integer;
begin
    write('Band >'); readln(band);
    dsn:='log.'+band;
    assign(datfil,dsn);
    repeat
       write('start from scratch: a, append: b>');
       readln(band);
    until ((band='a') or (band='b'));
    if band='a' then rewrite(datfil) else append(datfil);
    repeat
      write('Call >'); readln(call);
      if length(call)<11 then call:=call+'
      repeat
         write('date or null >'); readln(date);
      until (((length(date)=0) or (date='1')) or (date='2'));
      if length(date)=0 then date:=datsa else datsa:=date;
      write('time >'); readln(time);
repeat
  if length(time)<4 then time:='0'+time;
until length(time)=4;
val(copy(sent,3,3),sein,cocode); sein:=sein+1;
{* prepare for null send string - phone only *}
write('sent or null >'); readln(sent);
if length(sent)=0 then
begin
   Str(sein,sent);
   if length(sent)<3 then
   begin
      repeat
         sent:='0'+sent;
      until length(sent)=3;
   end;
end;
if length(sent)=3 then sent:='59'+sent+'F';
if length(sent)<8 then sent:=sent+'      ';
write('rec >'); readln(rece);
if length(rece)<9 then rece:=rece+'       ';
if  (band='144') then
begin
   write('qth >'); readln(qth); write('dist >'); readln(dist);
   if length(qth)<20 then qth:=qth+'                ';
   repeat
     if length(dist)<3 then dist:='0'+dist;
   until length(dist)=3;
end          else
begin
   qth:='                ';dist:='000';
end;
```

```
      ZZZ:=call+date+time+sent+rece+qth+dist;
      write(ZZZ);
      repeat
         write(':ok= agn=N last=E >'); readln(ok);
      until (((length(ok)=0) or (ok='N')) or (ok='E'));
      if ((length(ok)=0) or (ok='E')) then
      begin
        writeln(datfil,ZZZ);
      end;
      ende:=(ok='E');
   until ende;
   close(datfil);
end.


program johnmo;
Uses CRT, Turbo3, Printer;
var
   call : string[11];
   date : string[1];
   time : integer;
   sent : string[8];
   rece : string[9];
   qth  : string[20];
   dist : integer;
   dsn  : string[7]; band : string[3]; drive : string[1];
   datfil, prfil : text;
   ZZZ : string[56]; datpr : string[8]; is : string[2];
   mode : string[5];
   pa, lc : ShortInt;
   cocode, y, PINX, inx, iw : integer;
   cw, dup, VK, VK2, VKK, H, I, P, Z, O : boolean;
   MISAT : array[1..9] of boolean;
   score, mul, bon : integer;
   rusco : longint;
   casa : array[1..300] of string[11];
   dasa : array[1..300] of string[1];
   tims : array[1..300] of integer;
   cwsa : array[1..300] of boolean;
function validco : boolean;
var li, li2, hour, houro, danu, danu2, abstim, abstimo, tidif : integer;
    houro2 : integer;
    vali : boolean;
begin
   vali:=true;
   if inx>0 then
   begin
      li:=inx;
val(date,danu,cocode); hour:=(time Div 100)+(danu-1)*24;
abstim:=hour*60+(time Mod 100); (* minutes absolute *)
repeat
if call=casa[li] then
begin
   if Z then
   begin
      val(dasa[li],danu,cocode); houro:=(tims[li] Div 100)+(danu-1)*24;
      if (hour=houro) then
      begin
         if (li=inx) then vali:=false (* no in betweens then *)
         else
         begin
            if (cwsa[li]=cw) then vali:=false (* same mode *)
            else
            begin
               li2:=li-1;
               if li2>0 then
               begin
               repeat
                  val(dasa[li2],danu2,cocode);
                  houro2:=(tims[li2] Div 100)+(danu2-1)*24;
                  if ((houro2=hour) and (call=casa[li2]))
                  then vali:=false; (* 3rd contact in hour *)
                  li2:=li2-1;
               until (((vali=false) or (houro2<>hour)) or (li2=0));
               end;
            end;
         end;
      end;
   end  (* End rules for NZART stations *)
   else
   begin
      val(dasa[li],danu2,cocode);
      houro:=(tims[li] Div 100)+(danu2-1)*24;
      tidif:=abstim-(houro*60+(tims[li] Mod 100));
      if ((NOT VK) or I) then
      begin
         if ((tidif<360) and (cw=cwsa[li])) then vali:=false;
      end
      else
      begin
        if ((tidif<180) and (cw=cwsa[li])) then vali:=false;
      end;
   end;
  end;
  li:=li-1;
  until ((li=0) or (NOT vali));
end;
if vali then
begin
   inx:=inx+1; (* function sideeffect: store in arrays *)
   casa[inx]:=call; dasa[inx]:=date; tims[inx]:=time; cwsa[inx]:=cw;
end;
validco:=vali;
end;
procedure wrtopic;
begin
    write(Lst,Chr(18)); (* release condensed print *)
    write(Lst,Chr(12)); (* form feed *)
    writeln(Lst,'Log VK2HZ/P for ',band,' MHZ Page: ',pa);
    writeln(Lst,' '); write(Lst,Chr(15)); (*select condensed print *)
    writeln(Lst,'Date     Time  Call    Band Mode   Sent    Received QSOp ',
                'Mlt Bon Total');
    pa:=pa+1; lc:=3;

end;
begin
  inx:=0;
  write('band>'); readln(band); write('file on drive a or c)'):readln(drive);
  Chdir(drive+':\'); dsn:='log.'+band;
  if band='3P5' then band:='3.5'; (* for topic *)
  assign(datfil,dsn):reset(datfil); pa:=1;
  wrtopic; (* write topics on new page *)
  rusco:=0;
  pinx:=0;
  repeat
   PINX:=PINX+1;
   readln(datfil,ZZZ);
   call:=copy(ZZZ,1,11);
   date:=copy(ZZZ,12,1);
   Val(copy(ZZZ,13,4),time,cocode);
   if cocode<>0 then begin writeln('*** time incorrect ***');
                           writeln(ZZZ); time:=0;
                     end;
   sent:=copy(ZZZ,17,8); rece:=copy(ZZZ,25,9); qth:=copy(ZZZ,33,20);
   Val(copy(ZZZ,54,3),dist,cocode);
   if cocode<>0 then begin writeln('+++ invalid distance +++');
                           writeln(ZZZ); dist:=0;
                     end;
   (* Now the whole record is subdivided in it's components *)
   if date='1' then datpr:='19/3/88 ' else datpr:='20/3/88 ';
```

```
  if (copy(sent,7,1)<>' ') then
  begin
     if (copy(rece,7,1)<>' ') then cw:=true
     else
     if ((copy(rece,3,1)<>' ') and (copy(rece,4,1)=' ')) then
     cw:=true
     else cw:=false;
  end
  else cw:=false;
  if cw then mode:='CW    ' else mode:='Phone';
  VK:=false;
  VK2:=false; VKX:=false; H:=false; I:=false; P:=false; Z:=false;
  VK:=((copy(call,1,2)='VK') or
       (copy(call,1,2)='VI')) or (copy(call,1,2)='AX'));
  (* VK contact *)
  for y:=0 to 9 do
  begin
    if y<>2 then
  begin
    Str(y,is); is:='/'+is; (* /x for check of call *)
    if (VK and (pos(is,call)>0)) then VKX:=true;
  end;
end;
if VKX then VK2:=false else
VK2:=(VK and (pos('/2',call)>0)) or ((pos('VK2',call)=1) and (NOT VKX));
VKX:=(VK and (NOT VK2));
P:=(pos('/',call)>0); (* portable station *)
Z:=((pos('ZL',call)=1) and (pos('/',rece)>0)); (* ZL fieldday station *)
MISAT[1]:=(pos('A',rece)>0); MISAT[2]:=(pos('I',rece)>0);
MISAT[3]:=(pos('C',rece)>0); MISAT[4]:=(pos('D',rece)>0);
MISAT[5]:=(pos('E',rece)>0); MISAT[6]:=(pos('F',rece)>0);
MISAT[7]:=(POS('G',rece)>0); H:=(pos['H',rece)>0); MISAT[8]:=H;
I:=(pos('I',rece)>0);
IF (NOT I) then
begin
   MISAT[9]:=false;
   for iw:=1 to 8 do
   begin
      MISAT[9]:=MISAT[9] or MISAT[iw];
      (* just if one of them is true, it is not an I type station *)
   end;
   I:=(NOT MISAT[9]); (* neither A to H -> must be I type *)
end;
(* now we have all the info to calculate the score *)
score:=0;
if (VKX and P) then score:=20;
if (VK2 and P) then score:=15;
if (VKX and H) then score:=10;
if (VK2 and H) then score:=5;
if (VKX and I) then score:=2;
if (VK2 and I) then score:=1;
if (NOT VK) then score:=2;
if ((pos('?',rece)>0) or (pos('?',call)>0)) then score:=0;
dup:=(NOT validco);
if dup then begin;
   score:=0; qth:='**** duplicate *****';
                    end;
write(Lst,datpr); write(Lst,time:4); write(Lst,' '); write(Lst,call);
write(Lst,band); write(Lst,' '); write(Lst,mode); write(Lst,' ');
write(Lst,sent); write(Lst,' '); write(Lst,rece); write(Lst,' ');
write(Lst,score:2); write(Lst,'  ');
case dist of
0..49    : mul:=1;
50..149  : mul:=5;
150..300 : mul:=10;
301..999 : mul:=20; end;
write(Lst,mul:2); if score>0 then bon:=10 else bon:=0;
write(Lst,'   '):write(Lst,bon:2);
if cw then score:=score*2;
score:=score*mul+bon; rusco:=rusco+score;
write(Lst,' '); write(Lst,score:3);
if ((dist>0) or (dup)) then
begin
    write(Lst,' '); write(Lst,qth);
    if ((dist>0) and (NOT dup)) then
                 begin
                  write(Lst,dist); write(Lst,'km');
                 end;
 end;
 writeln(Lst,' ');
 lc:=lc+1; if lc>59 then
 begin
  write(Lst,'--Progressive total: '); writeln(Lst,rusco:6);
  wrtopic;
 end;
until EOF(datfil);
write(Lst,'####### Final score: '); writeln(Lst,rusco:6);
end.
```

PACKET RADIO ON HF

David H T Tan 9M2DT
4 Jalan Derumun, Damansara Heights, 50490
Kuala Lumpur, Malaysia

Malaysia has a comparatively small amateur population. Nevertheless these amateurs have kept up with developments in amateur radio. There are groups of amateurs participating in amateur satellite operation, AMTOR and Packet Radio. There is an AMTOR mailbox station operated by 9M2CR and a Packet Bulletin Board 9M2BBS operated by myself. The number taking up Packet Radio is increasing.

Fortunately, the Malaysian Amateur Radio Society (MARS), which represents the amateur fraternity, has a very cordial relationship with the National Regulatory Authority and this has greatly helped the growth of amateur activity in Malaysia.

Despite the small, but increasing number of 'Packeteers, I am concerned with the growing opposition to the use of Packet on HF. There have even been suggestions from certain quarters that Packet BBS stations on HF be banned. I wish to submit that this is a retrograde step. I am confident that congestion problems with existing Packet Radio Systems can be substantially reduced with further technological development, mutually agreed operational procedures and as newcomers gain experience with this mode of operation.

It must be noted that the use of TDM (Time Domain Multiplex) enables multiple Packet QSOs to go on simultaneously on the same frequency; hence the mode is in keeping with the principle of spectrum conservation by increased channel utilisation. As an example, I believe there are at least nine BBS stations currently operating on the same frequency in the AsiaNet.

The IARU Administrative Council has made two resolutions recently as regards Packet Radio, viz:

RESOLUTION 86-2 CONCERNING PACKET RADIO OPERATION

(2) that member Societies are urged to encourage amateurs in their countries to confine HF Packet operation to the segments of the bands designated for RTTY and similar modes, viz; 14.070 to 14.100 MHz.

(3) that development work that takes place outside RTTY sub-bands should be confined to one frequency per band with the frequency to be designated by the International Secretariat for international communications after consultation with regional organisations and member Societies for domestic communications with due consideration of regional band plans, domestic regulations and the desirability of minimising interference to stations using other modes of emission.

(4) that member Societies are urged to address, through their regional organisations, the need for specific provisions for Packet Radio operation in their band plans consistent with world-wide activity.

RESOLUTION 87-2

. . .that member Societies are hereby urged to acquaint their members as to the undesirable aspects of the uncontrolled proliferation of unattended store and forward (mailbox) stations.

However, Resolution 86-2 is not being practiced for the following reason:

An examination of the activity between 14.070 and 14.100 MHz will reveal a great number of RTTY and AMTOR stations including mailbox stations in this segment. It was obvious to the Packet BBS operators that Packet will not work satisfactorily amongst AMTOR and RTTY transmissions because of the unique characteristics of Packet operation.

Therefore, HF Packet operators all over the world started operating above 14.100 MHz (LSB) for Packet operation in the 20 metre band. The BBSs are limited by mutual agreement to a number of spot frequencies in this segment with 2 kHz channel spacing, that is, centred on .103, .105, .107, .109, and .111 at the present time.

However, this has created another problem. SSB operators who have run regular nets in the area above 14.100 MHz object to Packet stations transmitting when the phone operators have occupied the frequency. The subject of band planning is therefore confronted by the 'I was here first' problem. Objections have also been raised by Region 2 operators on the grounds that Region 3 agreements are not binding as far as they are concerned. Yet another complaint comes from the Keyboard Packet operators who want real time QSOs but are unable to do so because of congestion due to the steady growth of BBS.

Currently, no special channel has been assigned for real-time operators. Perhaps this may be necessary to accommodate both BBS and real-time operators.

Congestion problems with Packet operation can be attributed to:

(a) Remote stations involved in down loading files.

(b) The rate of beaconing on HF Packet is the responsibility of the Packeteer. It is understood that excessive beaconing is unnecessary and contributes to channel congestion.

(c) The frequency on which two Packeteers operate has to be within very close limits if RETRYs are to be reduced. Newcomers are often not aware of this requirement and hence inadvertently contribute towards congestion. However, this problem will solve itself as the Packeteer gains experience.

(d) The same applies to the adjustment of the TNC even when one has locked on to the BBS station or to the distant station in real-time QSOs. This again results in RETRYs but as in (c), this problem too will be resolved as the Packeteer becomes more familiar with his new mode of operation.

It cannot be denied that Packet Radio network has contributed to international goodwill as a result of the large volume of traffic handled and that this has been the result of a great deal of experimentation in the true spirit of amateur radio.

It does not appear reasonable therefore that regulations imposed at an earlier period such as amateur operators must listen before transmitting, restrictions as to unattended operation etc, should be invoked to stifle the development of Packet Radio. No other field of engineering has experienced such enormous strides in development as the electronic field and consequently these earlier regulations should be modified to accommodate advances in technology like Packet Radio. In this respect, I am glad to say, MARTS, although a small society, has already approached the Malaysian Regulatory Authority to revise the regulations pertaining to third-party traffic.

From the above, it is clear that teething problems are being experienced by this new mode of operation but it is felt that with developments in technology and co-operation, a solution can be found, for example, there was significant improvement when Level 3 networking was introduced.

On the whole it can be said that HF BBS operation has been satisfactory so far taking into account the inexperience of most users. Better understanding of operating procedures, tolerance of others, and adjustments of the times of downloading files to periods of low activity, will help reduce the congestion currently being experienced.

It is obvious that Packet Radio, particularly HF BBS operations, cannot share a section of the band along with other modes and so allocating the RTTY sub-band for this mode does not solve problems.

It is acknowledged that the allocation of amateur sub-bands for specific modes is not the function of the national regulatory authority. It is up to the national societies in conjunction with regional organisations to formulate a 'Gentlemen's Agreement' to enable the various modes to operate without interfering with each other. In fact, this is contained in point (4) of Resolution 86-2 which states: 'that member societies are urged to address through their regional organisations the need for specific provisions for Packet Radio operations in their band plan consistent with world-wide activity'

Self-regulation in the Amateur Radio Service has played an important part in the policing of amateur radio in the past and the same would apply to the problems being experienced with Packet Radio communication. It is acknowledged that in the early stages of Packet Radio development, inefficient use of the band may have created problems but these have, to a large extent, been overcome.

Problems can also be minimised by mutually agreed procedures, for example:

(a) Originators of messages for users of BBS in other local area networks should not attempt to lodge their messages directly on HF but use the message forwarding facility of the local BBS.

(b) Message forwarding takes place at times of least activity.

(c) The number of the BBSs on network frequencies should be controlled.

(d) To beacon less frequently since it is now rare to find an amateur who has not at least some idea of what Packet is.

(e) In view of increasing congestion, some suggestions concerning HF Packet operation for individual users are:

(i) Set PACLEN to 80 or less depending on the quality of the link.

(ii) Set MAXFRAME to 1 or 2 so that the number of data bytes sent in the information field in combination with PACLEN does not

exceed 80. This will minimise the number of RETRYs.
(iii) Set USERS to 1 to disable multiple connections and avoid using digipeated Packet operation if possible.
(iv) QSY off the BBS frequencies as soon as possible when QSOing with individual users.
(v) Set FRACK to a sensibly long value such as 10.

For further development of Packet Radio, it is essential that it be given a minimum of 25 kHz in each of the HF bands. On 20 metres, the band segment 14.101 to 14.125 would seem appropriate. Unless adequate provision for Packet Radio is included in HF Band Plans, the problem facing the store and forward operation of unattended BBS stations is unlikely to be resolved.

The above is a paper presented by David H T Tan 9M2DT (sysop @ 9M2BBS), Kuala Lumpur, Malaysia, at the AsiaNet HF Sysop Conference held in Brisbane, Queensland, from September 3-4, 1988.

ar

SILENT KEY

Richard Morse W1GR, died on July 1, this year, at the age of 76.

Richard was past Assistant Secretary of the Army for Research and Development under both the Eisenhower and Kennedy administrations, as well as the founder of the Modern Maid Corporation.

Of recent years he was the Director of the Boston Museum of Science. He was a descendent of Samuel F B Morse, whom we all know so well.

—Condensed from *The ARRL Newsletter* Volume 7 Number 17 by Ken McLachlan VK3AH

ar

TRY THIS

STOP YOUR TH3 JUNIOR DROOPING

Arthur Brean VK6SY
28 Bennion Street, Trigg, WA. 6029

This modification also deters large birds (crows, etc) from perching on the elements!

Recently, I took possession of a TH3 Junior Yagi which was looking rather tired. I tried the old method of giving the tubing in the elements half a turn and, although it looked better, it still drooped.

Three tubes were then made up (as in Figure 1) using the bolt in place of the anchor bolt in the element to boom bracket. The dowels are five-eighths of an inch in diameter and 12 inches long.

The braided rope, (non-conductive) is four millimetres and is tied off outboard of the 15 metre traps (see Figure 2). Allow the rope to stretch under tension before putting the Yagi on the tower.

Perhaps with strengthening, this idea could be used on the bigger Yagis. It works well on the TH3 Junior and deters large birds from perching on the elements.

ar

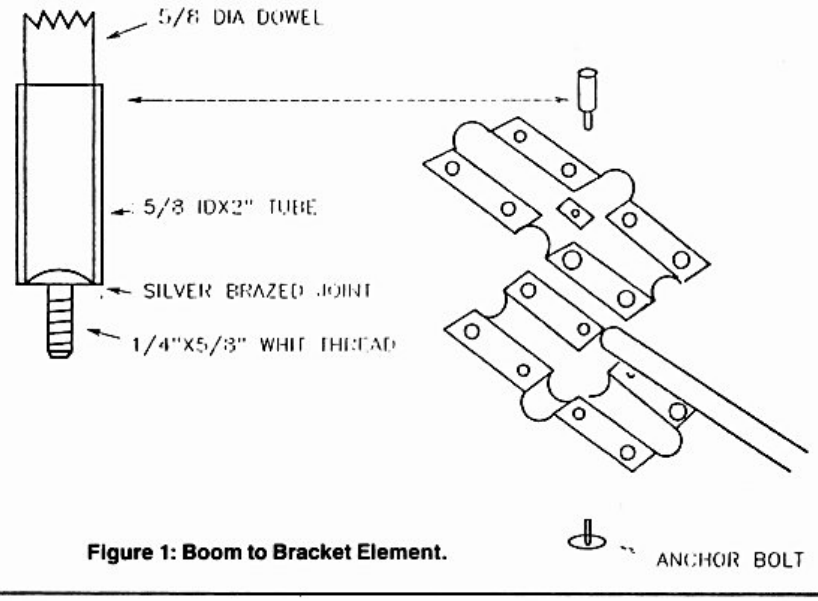


Figure 1: Boom to Bracket Element.

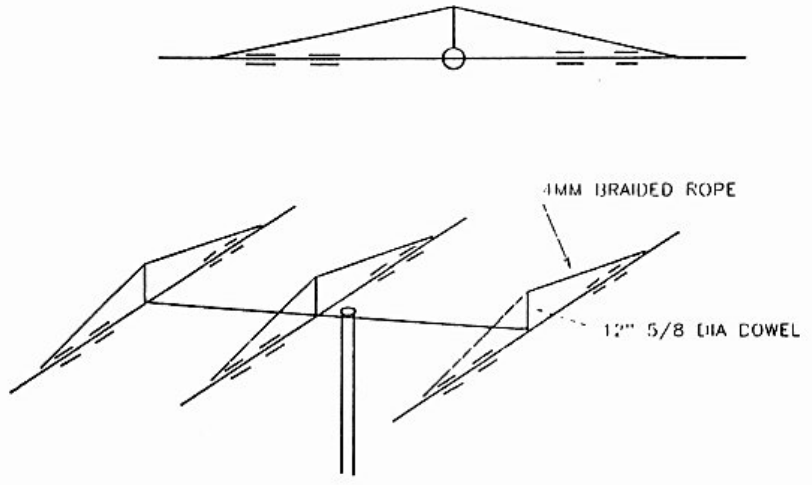


Figure 2.

TRY USING JAPANESE MORSE CODE WITH JA-STATIONS

English *Good day, very glad to see you first time.*

JA-CODE DO KN AR C P K B GN I BT RN AS BT C L L G X OA SN

English *I will send my QSL card sure, please send me your QSL card.*

JA-CODE DO L WA UT I K L R S OA I AS V G X OA OK F S L S DN N AA GN V SN

English *Best 73 and good DX I hope to see you again goodbye.*

JA-CODE DO K I OA UT 73 X N AS BT HH L L G X GN M U KA M U R S SN

When you sent these JA-Codes, if JA-station answers with many JA-Codes. Please send this to him.

English *I can send only this one JA-Code, hi!*

JA-CODE DO K X I AR K KN O N I Y HX L HH I HD I WK AR B B B SN

(DO is like BT in English-code, and SN like AR.)

(By JA1AR)

PRACTICAL JAPANESE FOR ENGLISH SPEAKING AMATEURS

It is true Japanese is one of the most difficult languages to learn in the world, but when it is limited to the amateur's simple sentences, greetings and numbers, English-speaking amateurs can easily speak Japanese by the following (English spelled) method.

Japanese amateurs will warmly welcome practical Japanese.

(English)	*(Japanese Pronunciation)*	*(Japanese CW Code)*
Good day. (anytime for greeting)	corn-each-war. Konnichiwa.	KN AR C P K
Good morning.	ohio! Ohayoh.	AS B M U
Good afternoon.	corn-each-war. Konnichiwa.	KN AR C P K
Good evening. (on meeting)	corn-ban-war. Konbanwa.	KN AR B I AR K
Good night. (on parting)	Oh-ja-see-ne-mot-say. Oyasuminasai.	AS W OA UA R KA A
This is JA1ABC, come in please	Coach-rower JA1ABC death, daw-though Kochi ra wa JA1ABC desu, doohzo.	
I am very glad to meet you first time.	Hedge-may ma-she-te, you-row-shick! Hajime mashite, yoroshiku.	B KR I BT X MK RN
Your signal is 59. (go = five Q = nine)	Signal war go Q death. Shignaaru wa gon kyu desu.	
My QTH is CHIBA city, near TOKYO.	QTH war CHIBA she, TOKYO no sober death. QTH wa CHIBAshi, TOKYO no soba desu.	
Address is	Jew-sho-war ..... death. Jyusho wa ..... desu.	
My name is BOB.	Now-my-war bob death. Namae wa BOB desu.	R X HQ K (BOB) RK I OA
Thank you very much nice QSO.	QSO alligator! (early-gat-tough). QSO arigato.	(QSO) GN G L I UT U
I would like to have your QSL.	QSL oh-net-guy she-nass. QSL onegai shimasu.	
I hope to see you again.	Matter I ma-show. (ma like mather) Mata ai masyo.	
Best 73 and good DX.	(A Japanese amateur can understand this sentence).	
Good bye.	Sir-your-now-rat. Sayonara.	KA M U R S
So long.	Journey. Jyaane.	
73.	Non-jew-sun. Nanajyu-san.	
88.	Hatch-jew-hatch. Hachijyu-hachi.	

CARDINAL NUMBERS

0	*RAY*	REI			
1	*EACH*	ICHI	6	*ROCK*	ROKU
2	*EHEE*	NI	7	*HITCH*	SHICHI
3	*SUN*	SAN	8	*HATCH*	HACHI
4	*SHE*	SHI	9	*Q*	KYU
5	*GO*	GO	10	*JEW*	JYU

When using Japanese Morse code, you must put -..--- at the beginning. (like -...-)
...._ at the end. (like .-.-.)

ELECTRONICS AND AMATEUR RADIO IN TASMANIAN EDUCATION

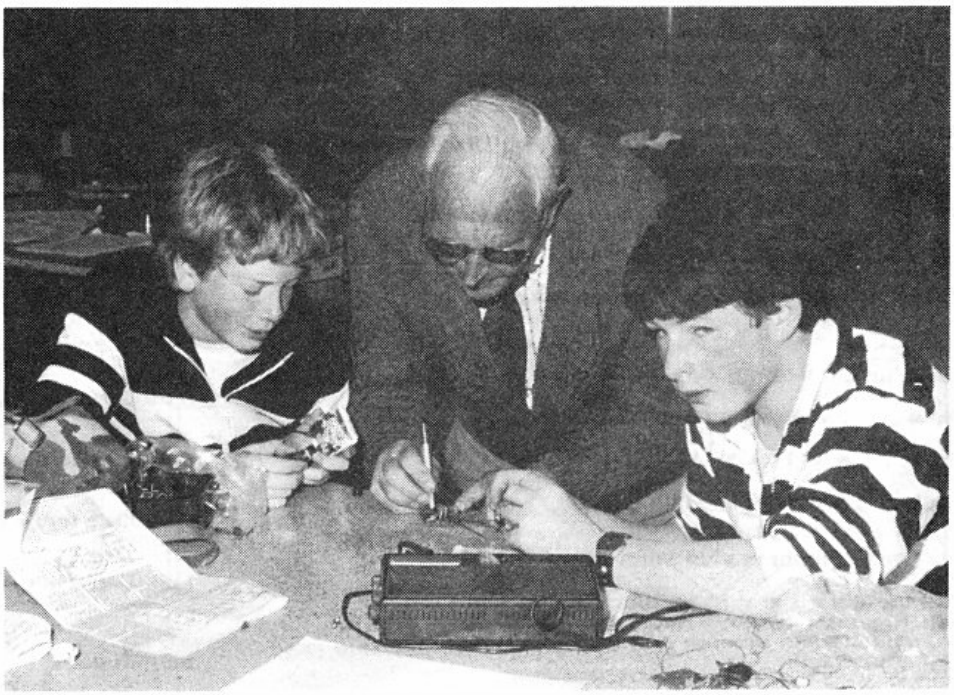
Tony Clayton VK7AH
10 Wrenswood Drive, Quoiba, Tas. 7310

Education has perhaps been a little too slow to catch up with progress.

"You are lucky to be in a school offering electronics. Take my advice: when you go for your interview, take along something you have made, be prepared to take the lid off and explain what some of the components do, and if my guess is right, . . ." That was the gist of the advice given to a girl in a Tasmanian high school by an Armed Forces career officer. Of course, some training in electronics is not the only criterion for entry to the Armed Forces, but the conversation does reflect the urgency felt by many employers, both small and large, to see a greater proportion of future employees having some experience in electronics.

It is easy to see that this is quite reasonable, when one considers the vital role which electronics plays in science, technology, commerce, communications, education, defence and entertainment. And yet we have an anomaly in the education system in that, while schools would not think of depriving their students of opportunities to study the traditional subjects, most do not offer substantial courses in electronics, despite the overwhelming relevance and need. Education has perhaps been a little too slow to catch up with progress, especially when we consider that schools are educating their students for the future in which, presumably, electronics will play an even greater part in day-to-day life than it does at present.

Some would say that electronics need only be taught in Technical and Further Education colleges and other tertiary institutions. But this is not the view of the Tasmanian TAFE colleges themselves, nor of the tertiary institutions, nor of the employers to whom I have spoken, nor of the Tasmanian Education Department. In fact, it is true to say that there is a great deal of support for the establishment of courses in electronics in secondary education, from students, parents and teachers, as well as from other educators and employers. But there is reluctance on the part of some schools to offer electronics in their curricula, mostly because they do not have a staff member confident to teach it, or because they are concerned about the (perceived) financial burden of establishing a new practical subject, or, dare I say it, because some have yet to be convinced of its importance. The Tasmanian State Institute of Technology has agreed to offer a new retraining course, "Electronics for Teachers". It is to be hoped that this will help to solve the first of the impediments, and that the others, too, will soon fade. Nevertheless, the decision as to whether to include electronics in its curriculum belongs to the individual school. At least, from this year, Tasmanian schools will have a range of new syllabuses available. And this brings us to the exciting part of the story . . . but first, just a little history.



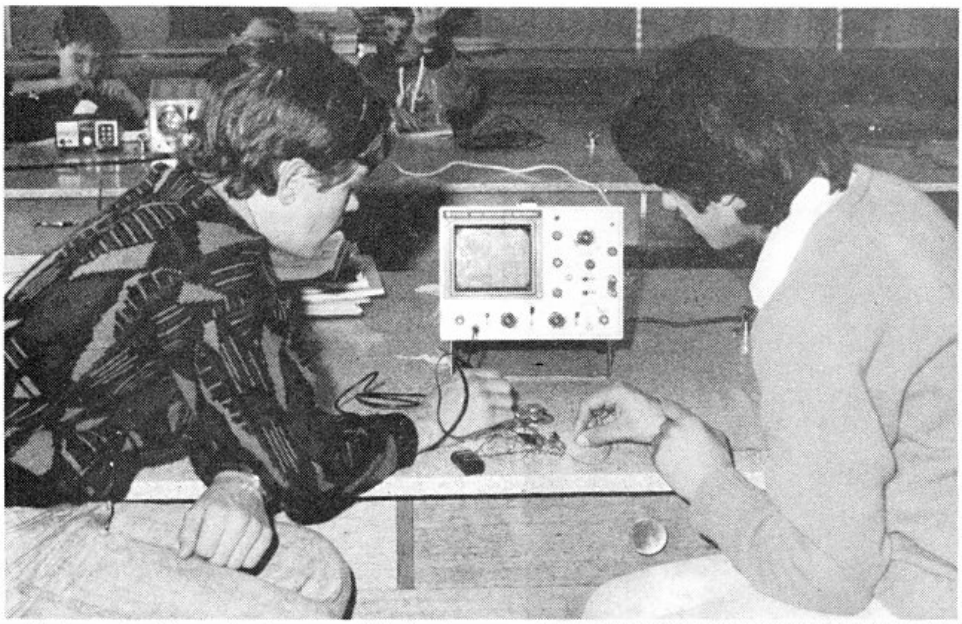
Jack Wright VK7WJ, assists Devonport High School students, (from left) Chris Dawes and Richard Bardenhagen to tune their "bug" during the School's Activities Week, October 1988.

In Tasmania, secondary education is divided into two parts: years 7 to 10 are in "high schools" and years 11 and 12 in "secondary colleges". Before 1983, there was almost no electronics: a few schools and colleges ran short courses, mostly kit construction, and there were some aspects covered in science and physics courses. In 1983, a two-year electronics course was introduced by the Science Subject Committee of the Schools Board of Tasmania as an optional subject for years 9 and 10. At Devonport High School, there is an average of 70 students, about one fifth of the years 9 and 10 population, enrolled in this course over the past six years. (Although, for the above and other reasons, the number of schools offering this subject has been limited). But it has been a good starting point.

As a result of interest created by this course, the Electronics Planning Group was formed. Over the past two years this Group has grown in size, influence and expertise and now boasts more than 40 members from high schools, colleges, Catholic education, the University, TAFE, the TSIT, the Australian Maritime College, Parents and Friends, administration and employers. Formation of this Group has coincided with the introduction of the Tasmanian Certificate of Education — a new system for certificating students at the end of their secondary education — and of a completely revamped and renewed set of courses for years 9 to 12. This has presented an ideal opportunity to introduce some new syllabuses — in Electronics.

The Schools Board has now formed an Electronics Committee, a subgroup of the EPG, and has given it the authority to prepare courses in electronics for students of all abilities from years 9 to 12. Trialling of these courses will begin in 1989 and they will be progressively phased in from 1990 to 1993. Thus, if a school decides to make appropriate provision in its curriculum, a student may:

- study electronics for as little as 25 hours, or as much as 450 (or more) hours over four years,
- in an extended course, select from a range of areas of specialisation, including radio,
- emphasise mainly construction aspects (for less academic students), application (for average students), or design (for more gifted students).

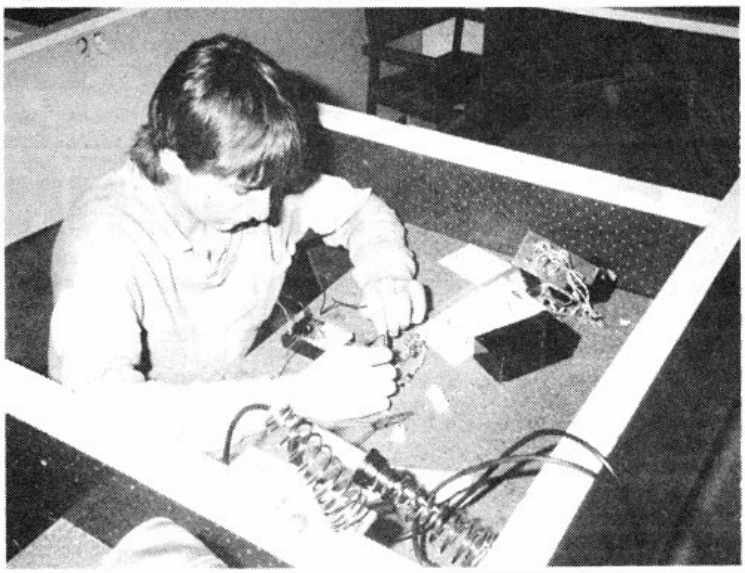


Devonport High School students, Stuart Matthews (L) and Timmy Vassiadis looking at the output waveforms from a "Music Maker" circuit.

tions. Having decided to make NAOCP and AOCP modules available, it is a natural step to offer the examination and, if appropriate, an Amateur Operator's Certificate. This would provide students with a worthwhile additional incentive in the course. Hence, three members of the Electronics Committee (VK7s MA, HZ and AH, all members of the Wireless Institute of Australia (WIA)) have jointly applied to DOTC for approval to conduct amateur licence examinations. If approval is given, papers will be made available to schools and colleges throughout the State and, if required, to other organisations, such as the WIA Branches. This is likely to have profitable consequences for both amateur radio and the WIA, as far as membership is concerned! Already, through their activities in electronics and radio (with the club station, VK7DHS) at Devonport High School, six students have used the present system to gain their novice or limited licences.

And now, for those who have read his far to find out what all this has to do with amateur radio — your perseverance is rewarded! Syllabuses are being written as either 25 or 100 hour subjects (the latter to be studied for one year) and all will be based around 25 hour modules. Topics will include basic electronics, radio, digital, electronic music, robotics, NAOCP and AOCP — about 20 in all. Of course, most will have to e divided into more than one 25-hour module and many will have prerequisite subjects. For example, Radio 1, Radio 2, and Antennas will be amongst the necessary prerequisites for NAOCP. This is to say that, as part of their schooling, students should have the opportunity of studying for and receiving their Amateur Operator's Certificate of Proficiency — if they wish to specialise in this area. Others may choose to specialise in microprocessors or analogue devices, etc.

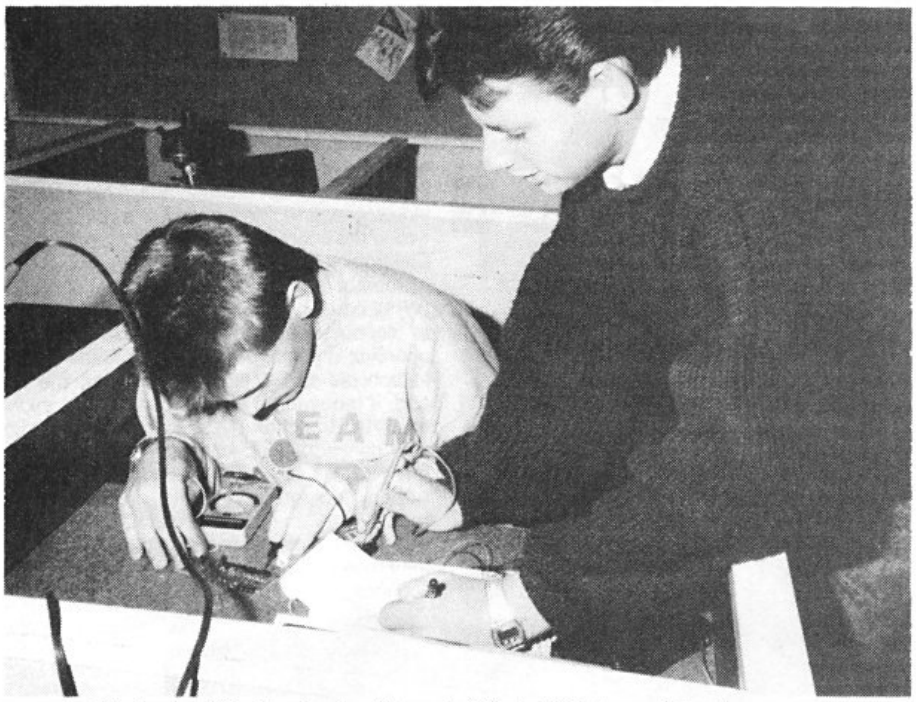
A happy coincidence has been the present devolvement of amateur licence examinations by the Department of Transport and Communications (DOTC) to approved individuals and institu-



Electronics at Elizabeth College, Hobart.

It is a long story; battles have been fought, arguments won and decisions made, but at last it seems that Tasmania is approaching a time when a relevant, interesting and flexible set of courses in electronics will be available to its secondary students. We have started from scratch, working without the benefit of similar courses against which to compare our own, but inputs from many people with wide-ranging expertise have, to some extent, compensated for this. This year, thanks to CRA Limited, the writer will be looking at electronics in secondary education in Europe, USA and Japan, and our offerings will no doubt benefit from that experience. Nevertheless, there will be mistakes and omissions made, and changes and improvements will be necessary, but it is definitely a step in the right direction. Only if they have had opportunities to develop aptitudes and interests and to see for themselves what electronics is all about can students be expected to make in-

Matthew West, with interested onlookers, during operation of the Devonport High School Club Station, VK7DHS.



Students of the Electronics Class at Elizabeth College, Hobart.

formed decisions in favour of careers or further study in this area of technology. And only then can they make the contributions which will be vital to maintain Australia's competitiveness in the technological world of the future.

Finally, how about some response? I would be very interested to hear from anyone who would like to comment on the above, or who may be involved in some way in the teaching of electronics in another State. In Tasmania, we have found that co-operation between all interested parties has been a very productive approach and I have no doubt that the principle could be extended beyond the State. I would be happy to provide further details, a copy of our overview, syllabuses, etc, especially for people in educational institutions and we are, of course, keen to hear about what is happening in other States. If you would like to make contact, please phone me at home (004) 24 5375, or at school (004) 24 3900, or write either C/- Devonport High School, Best Street, Devonport, Tas. 7310 or to the address at the head of this column. For materials, preferably send a blank disc (3.5 or 5.25 inch), which can be written in Amiga or IBM compatible 720k (double-sided) format; indicate whether you prefer WP or ASCII files. Alternatively, if hard-copy is preferred, please send an A4 sized, stamped, self-addressed envelope.

ar

RINGO ANTENNA

Ian Crompton VK5KIC
9 Craig Street, Richmond, SA. 5033

From HF we all know of the fullwave loop and the DDRR quarterwave loop resonated by a capacitor at the free end.

Research in Italy, and possibly elsewhere, tells of a loop a halfwave long. A closed loop, not an open loop, with a capacitor at its free end as the quarterwave loop is.

Information from Italy shows plots of resonant frequency and of resonance impedance for the halfwave form plotted against either feedpoint-groundplane link angle or of spacing between element and groundplane in wavelengths.

There are also comparative plots of the impedance at resonance of the quarterwave loop and of the halfwave loop, and of bandwidth, in both cases in relation to feedpoint-groundpoint angle.

The quarterwave loop impedance as against feedpoint to groundpoint connection angle ranges from just over 50 ohms to somewhere around 1 000 ohms.

Impedance of the halfwave closed loop ranges in terms of feedpoint angle from about 35 ohms, peaking close to 50 ohms, then falling away gradually.

In terms of element-groundplane spacing there is no plot shown for the capacitor resonated quarterwave, but the closed halfwave loop shows 10 to 50 ohms.

For the halfwave loop, both feedpoint angle and element-ground spacing affect resonant frequency, which can be capacitor tuned by a capacitor opposite on the ring to the element-groundplane connection.

For halfwave elements cut for 400 MHz, the resonant frequency ranged from 330 MHz to close to 500 MHz in terms of feedpoint angle for constant height above groundplane. This was without a capacitor to adjust.

Element-groundplane spacing adjusted resonant frequency from about 330 MHz for close spacing t a little over 480 MHz for feedpoint angle held constant.

Resonant frequency against height is plotted as a nearly straight line in the reference *Electronic Letters* when plotted against h/lambda, but shows a similar more complicated relationship when you plot resonant frequency for the halfwave form against element-groundplane spacing having multiplied h/lambda by wavelength for that frequency.

The item in *Electronic Letters* shows comparative plots of radiation pattern for the halfwave and quarterwave loops.

In the vertical plane, the halfwave has a little gain over the quarterwave lop, varying in amount with angle from the ground and being least at about 40 degrees. The sharp null above the quarterwave loop is present but not as deep as for the halfwave loop.

In the horizontal plane the same plot, close to an even circle, is given for each.

Both sheet-groundplane and groundplane reduced to an element forms exist. The work by G6JP, in contrast to the Italian work, claims the groundplane form supports typically a three percent bandwidth compared with 10 percent for a monopole (with groundplane?).

But, suitably tuned, three percent would support the typical 10 MHz bandwidth of a hand-held for use portable in the 420-450 MHz band.

Trying a groundplane-reduced-to-element form with central feedpoint, and not external feedpoint as shown in the diagrams with elements, both of them, cut for 500 MHz I got a SWR ranging from 1.3 to 1.7 across 433 to 440 MHz. I then removed 'surplus' wire, tidied things up (?) a little and blew the SWR to >5 across that segment!

As one of my great-uncles used to say; "You'll learn! Maybe, you *are* learning!".

REFERENCES

Electronic Letters, Vol 1, No 7, September 1965.
HAWKER, Pat, G3VA. Amateur Radio Techniques, RSGB, 6th Edition, 1978, pps 248-9 and 264.
JESSOP, G T, G6JP. *VHF/UHF Manual*, RSGB, 4th Edition, 1963, pps 8-34 and 8-35.

ar

RSGB DATA SYMPOSIUM

The first RSGB sponsored Data Symposium was conducted over the third weekend of July, with some 120 people and a dog called Dancer attending.

The program consisted of 21 lectures on subjects such as digital signalling techniques, satellite communication, composing pictures using a RTTY terminal and high speed modem use, to mention only a few. Many and varying types of projects were also described to a very attentive audience.

Many discussions took place, with much swapping of information and material from visitors from many countries. Included in the group was Joseph EI3EG, a 'white cane' operator who runs a very successful mailbox with the aid of a speech synthesiser. Joseph was accompanied by Dancer, his very well trained and behaved guide dog, who was a big hit with all the group.

It is anticipated to conduct this Symposium as an annual event and if you are interested in attending, drop a line to Mike G3XDV with an SAE plus English stamps or a 'green stamp' to defray postage expenses.

—Condensed from *Gateway* Volume 4 Number 24, 1988 by Ken McLachlan VK3AH

ar

QRP IN THE 1920s

Colin MacKinnon VK2DYM
52 Mills Road, Glenhaven, NSW. 2154

In the August edition of AR, the News Editor, Jim Linton VK3PC, made brief reference of two historical snippets and suggested someone could shed more light on them.

The first came from an obituary of Loran (Windy) Windom W8GZ, which said he set a world low power record using 0.567 of a watt in a 1926 contact with Australian radio amateur 5BG.

Another reference from a 1924 WIA Victorian Division exhibition program said contacts with a power of .0037 of a watt had been achieved between Sydney and New Zealand.

Colin MacKinnon VK2DYM, has responded and his article which follows makes interesting reading.

A QRP contact between Sydney and New Zealand in the 1920s with only 0.0037 watts! I may be skeptic, but I suspect that the power given is an error (or the operator forgot to turn his filament supply on).

There are a number of reasons for being doubtful, one being that the common plate voltage for amateur valve transmitters was 250 to 300 volts, so the plate current would have been only 15 ***micro***-amps. Few amateurs would even be able to measure such low currents. Also, during the 1920s the aim of most was to generate more power to get more distance and even a single valve was capable of running two watts (and that was considered very low power!). From my files I suggest a possible explanation and some background on the likely radio amateurs involved.

Charles MacLurcan 2CM, was an avid experimenter in the early days of amateur wireless. His expertise achieved good DX using low power (10 watts) at a time when others couldn't even get interstate reports.

On June 4, 1922, he managed to transmit 705 miles with only 8.7 watts. (Note that the 8.7 watts could conceivably be mis-transcribed to 3.7, but I can't explain a few extra zeros).

The equipment consisted of three Radiotron five watt output tubes in parallel with a high tension supply of 300 volts DC. The actual voltage at the plates was 284 volts DC, with a plate current of 31 milliamps. The filament voltage was six volts and the radiation was given as 900 milliamps. The antenna, a four wire cage (called a "Sausage-type" in those days), 200 feet long and suspended from an 80 foot mast as an inverted Vee. The ends of the antenna were supported 25 feet above ground, and the natural resonance was listed as 325 metres. He had a counterpoise made from four wires each 220 feet long, spaced four feet apart and 10 feet above ground. The feeders were, of course, open wire type. The actual operating frequency was 135 metres (2.2 MHz).

2CM's transmission was heard by A L Dixon, the Senior Wireless Officer on the SS *Montoro* on its way to New Zealand (705 miles from Sydney). Dixon was also an amateur, 2AD, and was using a receiver with a single Expanse B valve. Dixon's report gave 2CM an S6 on speech and music, and an S8 on CW and Tonic Train. (Hands up all those who know that a Tonic Train is not a railway carriage for drunks!).

The transmission was also heard in Melbourne by Joe Reed 2JR, using a two valve receiver. Joe was another early New South Wales experimenter, and at the time had been transferred to Melbourne by his employer, Commonwealth Radio.

In July 1922, 2CM, using the same transmitting set-up, was heard in New Zealand by the operator on board the SS *Ulimaroa* whilst berthed at Auckland. This feat was applauded at a monthly meeting of the WIA NSW Division, and reported in *Sea Land and Air*. Could this be the QRP reception mentioned in the 1924 publication? I can find no other likely incidence in literature between 1922 and 1925. As for changing 8.7 watts to 0.0037 watts, I've told the newspapers a million times not to exaggerate.

Going back a little, Charles Dansie MacLurcan was an active experimenter in 1910, and had a "shack" in the Wentworth Hotel with a large antenna on the roof. It helped that his family owned the hotel. His equipment in 1910 comprised a Loose Coupler, a loading coil, with a choice of two silicon detectors and a perikon detector. He had three kilohm headphones. Chas, or "Charley" had two transmitters, a one inch spark coil with a helix and Leyden jars and a spark gap, as well as a 1.5 kilo-watt rotary converter run from the 240 volts DC domestic electricity supply, and converting to 500 cycles AC. This fed an oil-cooled transformer, a rotary spark gap with a glass plate condenser in oil, and a helix. Using the spark coil on 12 volts, he could send messages to ships up to 64 miles out of Sydney. With the larger set his best DX was 300 miles.

In 1911, MacLurcan was one of 26 officially authorised "private wireless telegraph stations"; in partnership with L S Lane who later became 2LL when such calls were issued.

A fire in the Wentworth Hotel destroyed the set-up, so Chas imported a half kilowatt set from Clapp Eastham Co of New York. He built a new receiver using a De Forest Audion, the first such valve in Australia. No sooner had he set up an enviable station when World War I intervened and the equipment was interned until 1919.

He moved to Agnes Street, Strathfield in about 1920 and built the equipment and antenna described above. By that time spark sets were passe and the race was on to build valve transmitters with useful output. 2CM was at the forefront of research in technical matters and propagation, as well as being a WIA councillor. There is much more to the MacLurcan story — but maybe another time.

In his note Jim also mentions a low power record set between 8GZ and 5BG using 0.567 watts. Some background on this possibility follows.

Another early experimenter who became interested in low power operation was Harry Kauper 5BG. Harry was the Chief Engineer for commercial station 5CL, in Adelaide, and a prominent amateur in South Australia.

Over the latter days of November 1925, he succeeded in contacting the United States of America on low power, as quoted from the South Australian *Wireless Weekly* of December 2, 1925.

"IS THIS A WORLD'S RECORD?
"5BG Does Some Eye Opening Stunts on Very Low Power and Wavelength

"Using a 201A tube and accumulator type B batteries on a homemade transmitter he succeeded in raising U2APM on 7.5 watts on the 26th and U2MM on the 27th." Both US stations were in New York City.

The report continues, and says that 5BG further reduced his power to 5.6 watts, and contacted both U6HM in California, U1AMF, and later U1AXA. The aerial used by 5BG was a single wire at 30 feet, with a counterpoise under it.

The article confirms the difficulty of measuring low power by adding:
"The aerial current was only 80 milliamps or lower, and has to be measured with an extremely low reading hot wire meter.".

The frequency is not given in the report, only the fact that it was "short wave", so it was probably in the 85-95 metre band (3.2 to 3.5 MHz), which had recently been made available to amateurs.

I have not found any mention of the record that 5BG is reported to have set with Windy 8GZ.

In looking at the claim that 8GZ used 0.567 watts, *including filament power*, a typical receiving valve using six volts on the filament would draw maybe 60 milliamps. That leaves about 0.2 watts for RF output. Considering the elementary state of the transmitters, receivers and antennas of the period, this is either a remarkable achievement, or for the skeptic, a case of the printer putting the decimal point in the wrong place. However, even if the figure was really 5.67 watts, it is still an exceptional feat.

See also *A History of Radio in South Australia, 1897-1977* by J F Ross, for more information on 5BG and his record.

ar

NOT ANOTHER ARTICLE ON THE G5RV!

Don Knox VK1DK
79 Harrington Circuit, Kambah, ACT. 2902

"What is the input impedance of the G5RV and is there a better length?"

MY GOOD FRIEND, Kevin VK2DYW, has extolled the virtues of a G5RV antenna for may years and has encouraged me to replace my 25 foot base-loaded vertical with one. While he has not yet succeeded, this article covers some research on centre feed wire antennas.

For those who have not heard of a G5RV, it consists of a centre feed wire antenna 51 feet either side (102 feet overall). From the centre of the antenna, a quarter wavelength of open wire 450 ohms feeder at 14.2 MHz is connected to coaxial cable (typically 50 ohms) which, in turn, is connected to the transceiver.

Kevin had noticed that an antenna tuner was essential between the coax and the transmitter to achieve 1:1 VSWR on all bands, even 14 MHz. Kevin raised my curiosity by asking two simple questions; "What is the input impedance of the G5RV and is there a better length?"

This article is based on my research into the theoretical impedance of thin wire antennas based largely on Kraus [1]. If you wish, you can apply the results for any centre feed antenna with sufficient accuracy to save a lot of the frustration of the cut and try method of combining antenna lengths and open wire feeders to achieve best multi-band operation.

METHODS OF CALCULATING ANTENNA IMPEDANCE

Kraus [2] has a number of chapters devoted to the simple centre feed antenna and provides a number of methods of determining the input impedance. Unfortunately, an exact solution is for the input impedance of a centre feed thin wire antenna of odd multiples of a half wavelength in free space [3]. The second if for a general solution for a centre feed thin cone antenna in free space [4].

An approximate solution for thick antenna in free space is outlined by Kraus based on work by Hallen [5]. Unfortunately, insufficient information is given to apply the results in general.

An approximate method of calculating the input impedance of thin wire antenna was suggested by Kraus [6] based on the exact solution for the thin cone case. An antenna, made up of two equal cones, can be represented by a constant impedance transmission line and the impedance at a point of maximum current. Similarly, an antenna made up of two equal lengths of parallel conductors, can be represented by a transmission line of equivalent average impedance and the impedance at a point of maximum current. In both cases, the input impedance at the centre of the antenna is equal to the impedance at the nearest current maximum to the centre transformed by the equivalent transmission line to the centre impedance. While the series resistance Rm, at a current maximum, can be calculated exactly using Kraus' formulas for a cone or thin wire antenna, the series reactance term Xm can only be calculated for a cone antenna and odd multiples of half wavelength thin wire antenna in free space.

To cut a long story short, I eventually used the results of Hallen to estimate the series reactance Xm and calculated the series resistance term Rm up to 4.5 wavelengths. These results are shown in Table 1. It should be emphasised that the Rm values are calculated from Kraus' formula [7], but the Xm values are "guess-timates" except at odd multiples of a half wavelength.

ODD MULTIPLES OF HALF WAVELENGTH

The input impedance of a centre feed antenna that is exactly odd multiples of a half wavelength long can be obtained directly from Table 1 because the current maximum occurs at the centre of the antenna. For example, a half wave dipole in free space has a series impedance of 73 ohms resistive and 43 ohms inductive. A 1.5 wavelength centre feed antenna in free space has a series input impedance of 106 ohms resistive and 46 ohms inductive. In all cases, the physical length would have to be reduced by a small amount to become pure resistive. In practice, an additional shortening is required because of the capacitance added to the antenna by the insulators.

CALCULATION ANTENNA IMPEDANCE

The steps to calculate the input impedance at the centre of a thin wire antenna in free space are as follows:

1. Determine the equivalent average transmission line impedance (Z0) of the wire antenna.
   Z) = 120(1n(21/d) - 1)
   where Z0 = average transmission line impedance (ohms)
   1n = log to the base e
   1 = overall physical length of antenna (metres)
   d = diameter of wire (metres)
2. Determine the physical length of the antenna in wavelengths
   Lw = 1*f/300
   where Lw = physical length (wavelengths)
   1 = physical length (metres)
   f = frequency (MHz)
3. Determine the value of Rm and Zm from Table 1 for Lw calculated in step 2.
4. Calculate the distance Lc of the current maximum om the antenna input for Lw calculated in step 2.
   Lc = Lw/2 + 0.25 for 0.0 < Lw > 0.5
   Lc = Lw/2 + 0.25 for 0.5 < = Lw > 1.5
   Lc = Lw/2 + 0.75 for 1.5 < = Lw > 2.5
   Lc = Lw/2 + 1.25 for 2.5 < = Lw > 3.5
   Lc = Lw/2 + 1.75 for 3.5 < = Lw > 4.5
5. Use a Smith Chart (or equivalent see List 1) to find impedance at the end of a line of impedance Z0 calculated in step 1 and length Lc calculated in step 4 when terminated by Rm — jXm determined in step 3. This is the input impedance Ra + jXa at the centre of the antenna.
6. Determine the equivalent length of the matching line Lm = Lp*f/(300*v)
   where Lm = equivalent length of the line (wavelengths)
   Lp = physical length of the line (metres)
   f = frequency (MHz)
   v = velocity constant of the line
7. Use a Smith Chart (or equivalent see Table 1) to find the impedance R1+jx1 at the end of the matching line of impedance Z1 and length Lm as calculated in step 6 when terminated by Ra+jxa found in step 5. R1+jX1 is the impedance at the end of the matching line of impedance Z1.

RESULTS

Table 2 and 3 gives the results for a G5RV antenna system connected to a 50 ohms coaxial cable. An examination of Table 3 confirms that the G5RV shows a low VSWR at 3.6, 14.2 and 24.9 MHz. Even then, the VSWR is far from 1:1, the best being 2.5:1 at 14.2 MHz. The G5RV has a very high VSWR at 10.1, 18.1 and 28.5 MHz, and around 10:1 at 7.2 and 21.2 MHz.

CONCLUSION

On the basis of these results, an antenna tuner is essential. The best place for the antenna tuner would be between the 450 ohms matching line and the coax to minimise the losses in the coaxial cable at the high VSWR exhibited at some frequencies. Nevertheless, an antenna tuner between the transmitter and the coax would also work well at 3.6, 14.2 and 24.9 MHz, but you would have to suspect that the overall losses would be quite high at other frequencies, particularly 10.2, 18.1 and 28.5 MHz.

It is worthwhile noting that the matching line length can be varied to minimise the VSWR at a given frequency. For example, if the 450 ohms matching line is made an odd multiple of a quarter wavelength at 28.5 MHz, the input

List 1 — Smith Chart Replacement.

```
10 PRINT"THIS PROGRAMME CALCULATES THE INPUT IMPEDANCE AND VSWR"
20 PRINT"AT THE END OF A TRANSMISSION LINE OF A GIVE IMPEDANCE"
30 PRINT"AND LENGTH WHEN TERMINATED WITH A GIVEN LOAD."
40 PRINT"THE EQUATIONS ARE GIVEN IN CHAPTER 16 OF THE ARRL"
50 PRINT"1985 HANDBOOK. SET LINE LENGTH TO 0 FOR VSWR"
60 PRINT"CALCULATIONS ONLY."
70 PRINT : PRINT
80 PI = 3.14159
90 PRINT"LINE IMPEDANCE(Z0) = "; Z0
100 INPUT"CHANGE Z0 (Y/N)"; A$
110 IF A$ = "N" THEN GOTO 130 ELSE IF A$ = "n" THEN GOTO 130
120 INPUT"LINE IMPEDANCE(Z0) ="; Z0
130 PRINT"LINE LENGTH (WAVELENGTH) = "; X
140 INPUT"CHANGE LINE LENGTH (Y/N)"; A$
150 IF A$ = "N" GOTO 170 ELSE IF A$ = "n" THEN GOTO 170
160 INPUT"LINE LENGTH = "; X
170 PRINT"SERIES LOAD RESISTANCE(RL) = ";RA
180 INPUT"CHANGE RL (Y/N)"; A$
190 IF A$ = "N" THEN GOTO 210 ELSE IF A$ = "n" THEN GOTO 210
200 INPUT"SERIES LOAD RESISTANCE(RL) = "; RA
210 PRINT"SERIES LOAD REACTANCE (X (+ or -)) = ";XA
220 INPUT"CHANGE X (Y/N)"; A$
230 IF A$ = "N" THEN GOTO 250 ELSE IF A$ ="n" THEN GOTO 250
240 INPUT"SERIES LOAD REACTANCE (X) = "; XA
250 R1 = RA/Z0 : X1 = XA/Z0     'ARRL P.16-2
260 A = 2*PI*X
270 IF (X - FIX(X)) <> .25 THEN GOTO 300
280 R2 = R1/(R1^2 + X1^2) : X2 = -X1/(R1^2 + X1^2)
290 GOTO 350
300 A1 = (1+(TAN(A)^2))
310 A2 = (1 - (X1*TAN(A))) : A3 = R1*TAN(A)
320 A4 = (1 - (TAN(A)^2)) : A5 = (1 - (R1^2) - (X1^2))*TAN(A)
330 R2 = R1*A1/((A2^2) + (A3^2))    'ARRL P.16-2 EQ. 5
340 X2 = ((X1*A4) +A5)/((A2^2) + (A3^2)) 'ARRL P.16-2 EQ.6
350 RG = Z0*R2 : XG = Z0*X2 'ARRL P.16-2
360 TAR = SQR(((RA - Z0)^2 + XA^2)/((RA + Z0)^2 + XA^2))
370 VSWR = (1 + TAR)/(1 - TAR) 'ARRL P.16-1 EQ.1 & P.16-2 EQ.2
380 PRINT : PRINT
390 PRINT"SERIES GENERATOR RESISTANCE (RG)= ";RG
400 PRINT"SERIES GENERATOR REACTANCE (XG) = "; XG
410 PRINT"VSWR = "; VSWR : PRINT : PRINT
420 GOTO 80
```

impedance is almost exactly 50 ohms.

I have also seen suggestions that a 1:1 or 4:1 ferrite core balun should be connected between the 450 ohms line and the coax, but I suggest it would be completely useless at the higher VSWRs and be an attenuator instead! By comparison, Kevin VK2DYW, has designed and built a 1:1 balun using ferrite beads to reduce skin currents on the sheath of the coax which does work but that is another story.

Of the questions originally posed by Kevin, I have answered the first, namely, what is the impedance of the G5RV. The second question, whether there is a better length, I will leave to the reader. Happy calculating!

REFERENCES

1. KRAUS, John D. Antennas, McGraw-Hill Electrical and Electronic Series, 1950.
2. As above. Chaps 5, 8, 9 and 10.
3. As above. Equs (10-57) and (10-58), p 261.
4. As above. Equs (8-27), (8-28) and (8-29), p 225.
5. As above. Chap 9.
6. As above. Section 8-6, p 228.
7. As above. Equ (5-90), p 143.

WAVELENGTH	Rm	Xm
0.0	0.00	0.0
0.1	0.19	5.0
0.2	2.88	10.0
0.3	13.18	20.0
0.4	36.13	30.0
0.5	73.13	43.0
0.6	119.82	60.0
0.7	166.40	75.0
0.8	200.68	90.0
0.9	212.69	130.0
1.0	199.09	170.0
1.1	165.30	170.0
1.2	124.44	150.0
1.3	92.98	120.0
1.4	84.73	80.0
1.5	105.49	45.0
1.6	150.34	10.0
1.7	204.97	5.0
1.8	250.69	30.0
1.9	271.36	75.0
2.0	259.63	140.0
2.1	220.12	180.0
2.2	168.00	180.0
2.3	123.65	150.0
2.4	105.03	100.0
2.5	120.77	47.0
2.6	166.62	15.0
2.7	226.80	0.0
2.8	279.66	20.0
2.9	305.86	80.0
3.0	295.75	140.0
3.1	253.26	180.0
3.2	194.70	190.0
3.3	142.74	170.0
3.4	117.95	120.0
3.5	130.85	47.0
3.6	177.78	3.0
3.7	242.04	0.0
3.8	300.08	30.0
3.9	330.33	75.0
4.0	321.51	140.0
4.1	277.04	180.0
4.2	213.96	200.0
4.3	156.60	170.0
4.4	127.42	115.0
4.5	138.38	47.0

Table 1 — Resistance (Rm) and Reactance (Xm) at a Current Maximum.

ANT. LENGTH= 102 FEET 31.0896 METRES

ANT. DIAMETER= .2 cm

ANT. AVERAGE TRANSMISSION IMP.= 1121

FREQ(MHZ)	L(WAVELENGTH)	Ra + jXa
3.6	.37	32 -j440
7.2	.75	400 +j1200
10.1	1.05	1600 -j2800
14.2	1.47	97 -j45
18.1	1.88	1700 +j2100
21.2	2.20	330 -j1100
24.9	2.58	170 +j310
28.5	2.95	4100 +j540

Table 2 — G5RV Antenna Input Impedance (Step 5).

MATCHING LINE IMPEDANCE = 450 OHMS

EQUIVALENT LENGTH (Lm) = 0.5 WAVELENGTHS AT 14.2MHZ

COAXIAL CABLE IMPEDANCE = 50 OHMS

FREQ(MHZ)	Lm	R1 + jX1	VSWR(50 OHMS)
3.6	0.128	15 - j10	3.3 : 1
7.2	0.254	50 - j140	10 : 1
10.1	0.356	61 + j450	68 : 1
14.2	0.5	97 - j45	2.5 : 1
18.1	0.637	103 - j490	49 : 1
21.2	0.747	50 + j160	12 : 1
24.9	0.877	113 - j52	2.8 : 1
28.5	1.0	4100 + j540	83 : 1

Table 3 — G5RV Impedance at Input to Matchline (Step 7).

WHAT'S WORSE THAN RADIO BLACKOUTS?

Volcanic Eruptions, for a start!

Ken Gott VK3AJU
38A Lansdowne Road, Saint Kilda, Vic. 3183

Volcanos belching ash and lava, satellites plunging to earth, aircraft passengers endangered by cosmic rays and blackouts affecting telephone cables, as well as wireless traffic, could be on the agenda for next year, according to a recent report. All could be attributed to the solar cycle, now surging towards a peak in late 1989.

Normally I would be inclined to regard such reports with scepticism. At best, I would see them as speculative, and at worst, as sensationalist.

For two reasons, however, I cannot be so dismissive. Firstly, because they appeared in a reputable UK journal, the *New Scientist,* but also because there is some supporting evidence for these dire predictions.

When the *New Scientist* article, in which the predictions were made, appeared on July 7, 1988, solar activity had been increasing at the fastest rate since observations started in 1840. The possible hazard to aircraft passengers at high altitudes — and even worse danger to astronauts — stems from the boost to the amount of cosmic rays reaching the earth.

Apart from this, it is thought that the stream of charged particles could disturb the paths of the 200 or so artificial satellites orbiting the earth, causing some to re-enter the atmosphere prematurely.

We all know about the effects on HF communications.

Data from the Sunspot Index Data Centre at the Royal Observatory of Belgium, suggests that no previous solar cycle since 1840 has risen so rapidly to the point it had reached in May this year. The Centre predicts that the cycle will reach a peak of about 170, but possibly as high as 200, in September 1989.

Meanwhile, Jim Shirley, a scientist based in California, had already predicted a similar peak of activity based on an independent study relating to movements of the sun.

It was news to me, but the sun is not the centre of the solar system. The true centre is determined by the positions and masses of all the planets relative to the sun. "On this basis, the sun follows a looping orbit around the centre mass, which is sometimes near the heart of the sun and sometimes outside its surface," to quote the *New Scientist* article.

There is no known reason why this motion should affect solar activity, but the records show a clear correlation between the sun-spot cycle and the rate of change of the sun's angular momentum (see Figure 1).

Shirley's observations show that the sun is making a very unusual loop around the centre mass of the solar system. Between 1984 and 2000 it will be travelling "backwards; compared to its average direction of motion during the past 13 centuries.

This "backward" motion will be most apparent in 1989-91.

Such an event has happened only twice before in the past 1300 years — in 1623-1663 and in 1810-1812.

In both periods there were severe volcanic eruptions and cooling of the climate due to dust from the volcanos blocking the sunlight.

So, when the sun has looped "backwards" there have been volcanic eruptions.

But, is this cause and effect — or an example of what were called "nonsense correlations" when I studied statistical methods at university?

These can take the form of two or more time series, which, when drawn as graphs, show a perfect or near perfect match — but one which is due to sheer accident.

The example given to us in classes was the average length of the sermons preached by a leading Anglican cleric, calculated on an annual basis, and the incidence of swine fever in South Africa. The two graphs matched almost perfectly over a period of many years, but obviously the sermons did not cause the swine fever, nor did periodic increases in the disease cause the cleric to be wordier than usual.

There is no apparent reason why the sun's motion should affect solar activity, nor why the latter should cause volcanos to erupt.

Shirley argues that the probability that the common pattern between the sun's motion and volcanic eruptions is due to chance is only four percent. He has therefore predicted volcanic and climatic extremes in the near future, even though the reasons for the changes are unknown.

The *New Scientist* comments that the linkage between the sun's change in angular momentum and sun-spot activity is more firmly based than Shirley's perceived link with volcanic activity; the former prediction seems to have been borne out by the Belgium data as analysed by the US National Oceanic and Atmospheric Administration, ie that solar activity is increasing at the fastest rate since 1840 and could peak in late 1989.

However, there are other complications. There is evidence that the earth is warming up (perhaps because of the greenhouse effect) and this may mask any period of cooling, similar to those in the 17th and 19th centuries, if such takes place. Also, some scientists are apparently worried that extreme solar events in 1989-1990 might partly conceal damage to the ozone layer resulting from aerosols and other chemicals — the reason being that increased flows of particles from the sun produce more ozone in the stratosphere.

ar

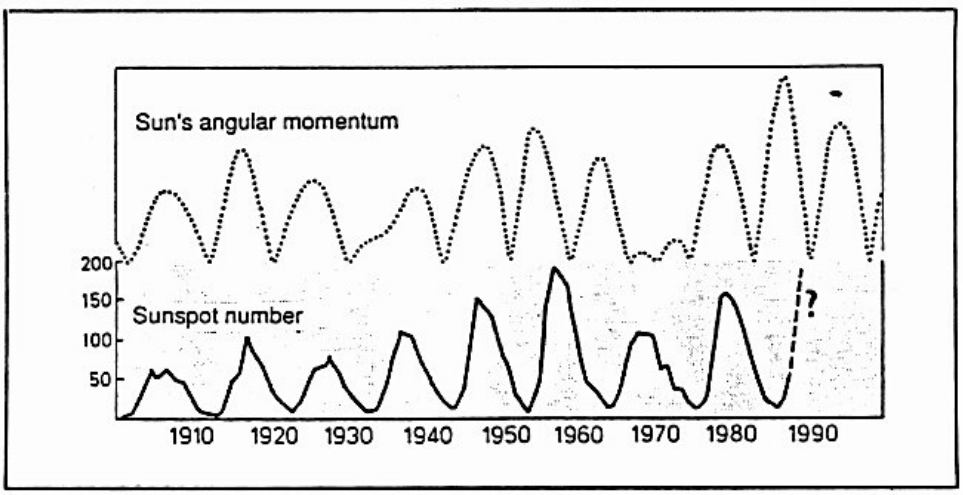
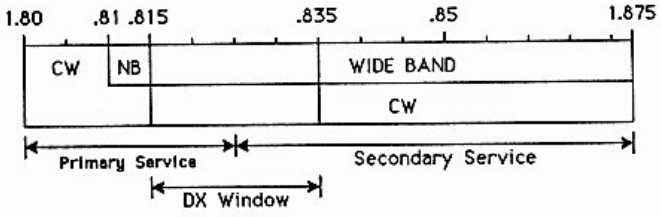


Figure 1: Momentum and sunspots — are the two by any chance related?
New Scientist July 7, 1988

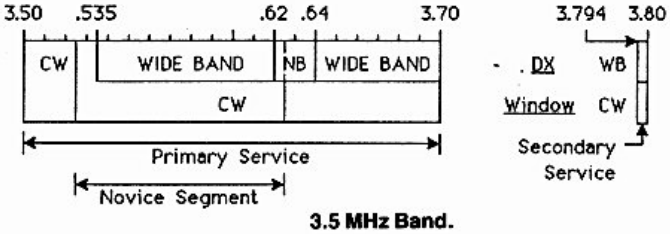
PROPOSED REVISED AUSTRALIAN BAND PLANS

The IARU Region 3 Conference, held in Seoul during October 1988, adopted a revised set of Regional Band Plans. The WIA delegates contributed to the band planning working group and identified areas where Australia might not be able to comply with proposed regional band plans. FTAC has now examined these plans, tested them against the Australian Band Plans adopted at the 1986 and 1988 Federal Conventions and derived proposed revised Australian Band Plans.

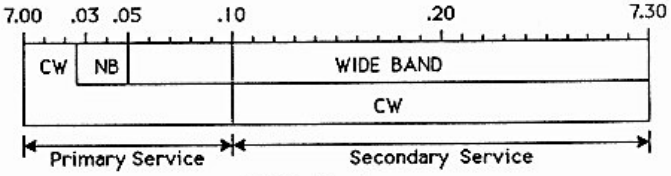
These band plans are offered for consideration by Australian radio amateurs and, if thought fit, adoption at the April 1989 Federal Conventions.



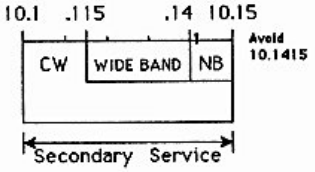
1.8 MHz Band.



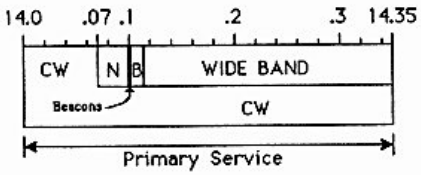
3.5 MHz Band.



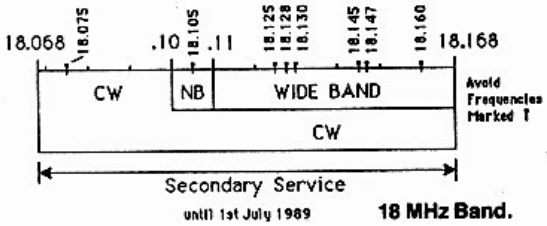
7 MHz Band.



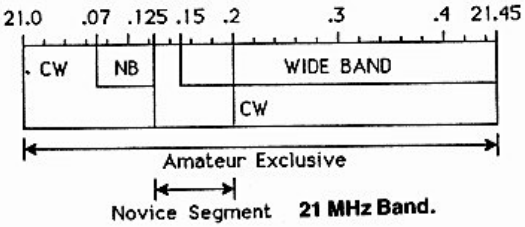
10 MHz Band.



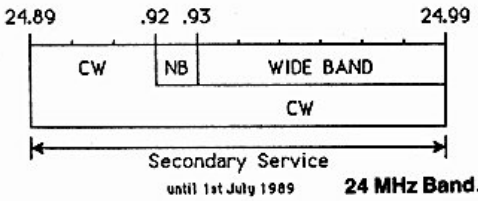
14 MHz Band.



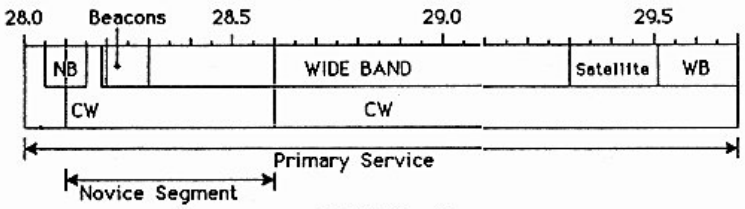
18 MHz Band.



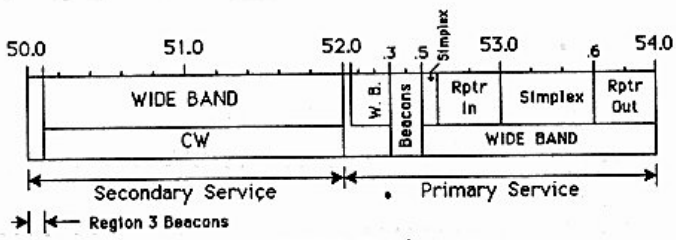
21 MHz Band.



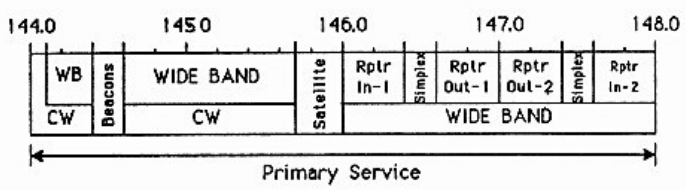
24 MHz Band.



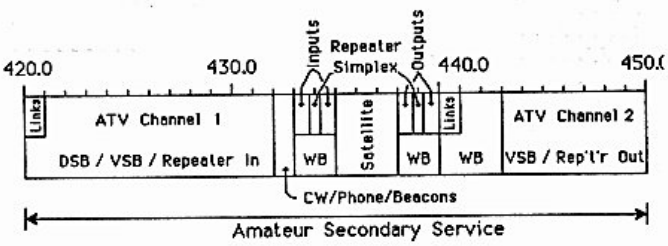
28 MHz Band.



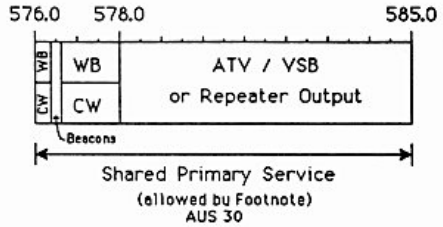
50 MHz Band.



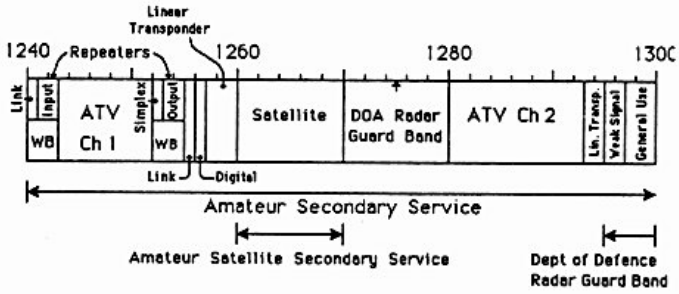
144 MHz Band.



420 MHz Band.



576 MHz Band.



1296 MHz Band.

PROVISIONAL MICROWAVE BANDPLANS
(Table 3)

2320 to 2450 MHz bandplan — Region 1

	Usage	
2300.000		
Sub-regional (National bandplans)		
2320.100		
CW exclusive	2320.000 2320.025	*EME* *(Moonbounce)*
2320.150		
CW & SSB	2320.200	*SSB centre of activity*
2320.800		
Beacons exclusive		
2320.990		
2321.000		
Simplex & repeaters (FM)		
2322.000		
All modes	2322 to 2355 2355 to 2365 2365 to 2370 2370 to 2390	*ATV* *Digital comms* *Repeaters* *ATV*
2390.000		
		EME (Moonbounce)
2392.000		
All modes		
2400.000		
Amateur satellite service		
2450.000		

3400 to 3475 MHz bandplan — Region 1

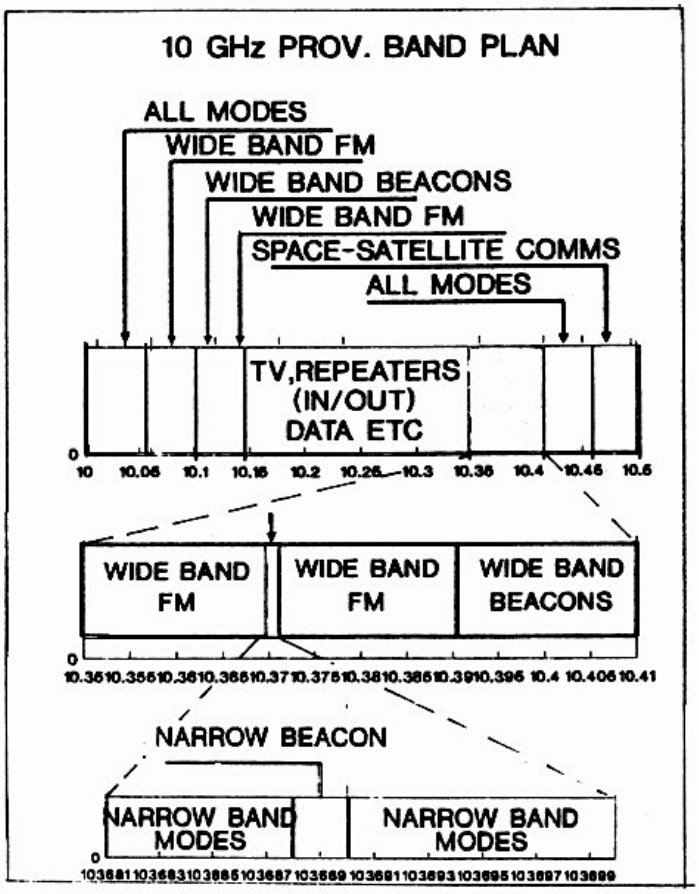
	Usage	
3400.000		
All modes		
3456.000		
Narrow band CW/EME/SSB	3456.250	*Centre of activity*
3458.000		
All modes		
3475.800		

Notes on the provisional 2300 to 2450 MHz bandplan

a) In countries which do not have access to the ALL MODES against 2322 to 2390 MHz, the FM SIMPLEX & REPEATER segment 2321 to 2322 MHz may be used for digital data transmissions.

b) In countries where the narrow-band segment 2320 to 2322 MHz is not available, the following alternative narrow-band segments can be used:
2304 to 2306 MHz
2308 to 2310 MHz

10000 to 10500 MHz bandplan — Region 1



Notes on the provisional 10000 to 10500 MHz bandplan

In those countries where the narrow-band segment 10368 to 10370 MHz is not available, the segment 10450 to 10452 MHz is suggested as an alternative narrow-band segment.

5650 to 5850 MHz bandplan — Region 1

	Usage	
5650.000		
Amateur satellite service (up-link)		
5670.000		
All modes		
5760.000		
Narrow-band CW/EME/SSB	5760.250	*Centre of activity*
5762.000		
All modes		
5830.000		
Amateur satellite service (down-link)		
5850.000		

24.0 to 24.25 GHz bandplan — Region 1

	Usage	
24000.000		
Amateur satellite service	24125.000	*Preferred operating frequency wide-band equipment*
24050.000		
All modes		
24192.000		
Narrow-band CW/SSB/Beacons	24192.000	*Centre of activity*
24194.000		
All modes		
24250.000		

47.0 to 47.2 GHz bandplan — Region 1

	Usage	
47000.000		
	47088.000	*Centre of narrow-band activity*
47200.000		

COMMENTS ON THE BAND PLAN

It has not been possible to adopt the Region 3 Band Plan for 1.8 MHz due to the much reduced Australian allocation, compared with other regional nations. Consequently, the 1986 plan has bee retained, although some out-of-band working may e necessary for DX operations.

It was possible for the WIA delegation to influence the Region 3 plan for 3.5 MHz to retain the existing division between CW and phone. This is obviously of advantage to Australian novice operators.

The increasing demand for spectrum for data communications, as reported by the Packet Working Group, has led to a redefining of narrow band modes bandwidth, which is now increased to up to 2 kHz occupied bandwidth. The narrow band modes segment has been moved down to 7.040 to align with Region 3. Opportunity has also been taken to align the lower edge of the narrow band modes segment with the regional plan at 7.025 MHz.

For the 10 MHz band, Region 3 defined a narrow band modes segment from 10.140 to 10.50 MHz. This does not vary from the existing Australian narrow band modes segment, however because of a spot frequency we must avoid, it may be desirable to widen the segment. We retain the right to use phone on this band for communications within Australia only.

The increasing demand for data communications has, likewise, led to an increase in the narrow band modes segment on 14 MHz. As packet and other traditional data modes, such as RTTY and AMTOR cannot co-exist, the band plan retains the traditional modes in the interval 14.070 to 14.095 MHz and places other data modes, including packet, in the interval 14.095 to 14.112 MHz, excluding the CW beacons at 14.000 MHz plus/minus a 500 Hz guard band.

No changes are recommended to the existing 18, 21, 24 and 28 MHz band plans.

The wide band modes repeater inputs segment has been changed from 52.600 to 52.975 MHz to allow a 1 MHz repeater split. This now places general all modes in the interval 52.000 to 53.400 MHz. This change took place in 1986 and is not consequent upon any Region 3 band planning actions.

No changes are recommended to the existing 144 and 420 MHz band plans.

Whilst no formal changes have been made to the 576 MHz band plan, it is recommended this band be reserved for ATV repeater outputs as long as it continues to be available for radio amateur use.

Changes were proposed to the 1296 MHz band plan as to repeater frequency sub-bands at the 1988 Federal Convention. Their adoption was conditional upon receipt of DOTC (Aviation Group) clearance that no interference was occasioned by the proposals. As that documented clearance has not yet been received, the band plans remain as adopted in 1986.

The 1988 Federal Convention, by adopting the FTAC Annual Report, adopted provisional band plans for the microwave bands up to 47 GHz. The plans adopted were the provisional Region 1 band plans, except for 10 GHz where the more detailed RSGB Band Plan (which conforms to Region 1 guidance) was provisionally adopted.

FTAC invites comments on these proposed revised Australian Band Plans. Comments should be directed to Divisional Federal Councillors, or as contributions to the columns of this magazine.

FTAC proposes to submit these revised Australian Band Plans to the 1989 Federal Convention for formal adoption.

Federal Technical Advisory Committee (FTAC)

November 1988

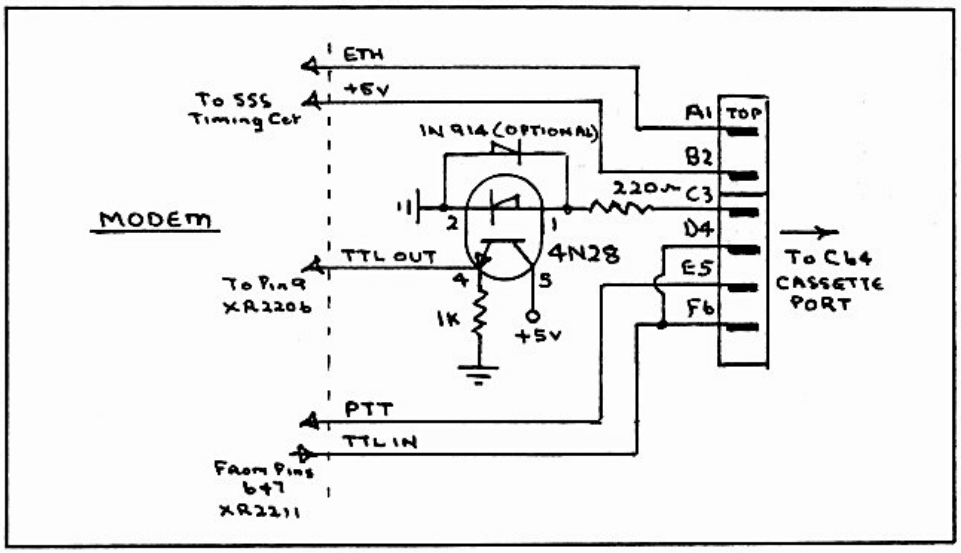
ar

ADDENDUM TO ADDENDUM

The drawing on page 52 of AR for October 1988 is reversed (left for right). All terminals and connections are still correct, but (my own mistake) it is not consistent with the drawing of the original modem in the July 1988 issue.

—Contributed by Ron Mills VK5XW

ar



IARU REGION THREE WORKING GROUP REPORTS

The recent IARU Region 3 Conference, held in Seoul during October 1988, set up several Working Groups to consider contributed papers on a common topic and to prepare recommendations for the Conference sitting in plenary session. There were three principle working groups, one devoted to regional band planning, one to packet radio and the third devoted to planning for the next WARC. The WIA contributed to all working groups, despite only having two representatives at the conference, both of whom convened a working group.

The Band Planning Working Group revised band plans derived at the last Region 3 Conference which was held in Auckland in 1985 and added two new band plans for the 1.8 and 3.5 MHz bands. They received initial inputs on the 1.8 and 3.5 MHz bands from the Packet Radio Working Group. The report of the Band Planning Working Group appears elsewhere in this issue of *Amateur Radio*.

Despite their adoption by the Conference, the band plans do not automatically become binding upon Australian radio amateurs. Indeed they have been examined by FTAC, who have recommended a revised series of Australian Band Plans for consideration and ultimately adoption if thought fit by the coming WIA Federal Convention, next April. These revised Australian Band Plans also appear in this magazine.

The Packet Radio Working Group's report is also included in this issue. In addition to the increased data modes frequency segments on several HF bands, which were passed to the Band Planning Working Group for action, the report contains some seven recommendations concerning the introduction and operation of packet.

It is anticipated these recommendations will become the basis of an Australian Position Paper on packet which will be published in this magazine shortly and offered for adoption at the April Federal Convention. Once again members will be given an opportunity to comment and guide these decisions through their Federal Councillors. Of course, comment through the columns of this magazine is always welcome.

The Preparation for Future WARCs Working Group's report appears elsewhere in this issue of *Amateur Radio*. Its recommendations including the Region 3 position on band allocations and representation on National WARC preparatory groups as well as on the National Delegations to Geneva, most likely in 1993. Again this topic calls for preparation of an Australian Position Paper for consideration and adoption at the April Convention.

IARU REGION 3 THE 7TH REGIONAL CONFERENCE OCTOBER 10 to 14, 1988 SEOUL, KOREA

REPORT FROM WORKING GROUP 1

Convener: ZL2AMJ

Members: 9M2DT, 9V1VS, G3FKM, HL1CG, K0TO, JA1AYC, YB0JH, ZL2NN and others from the Packet Radio Working Group. Terms of Reference: 1. To review band plans previously adopted by the Association,

2. To address any band plan changes that may be recommended by any Packet Radio Working Group set up by the Conference, and

3. To recommend updated band plans for HF, VHF and UHF for Region 3, for Conference consideration.

Relevant Papers:

Papers 8, 19m 49, 51, 52, 74, 79 and 93 were considered.

Meetings:

The Working Group met in conjunction with the Packet Radio Working Group to address the need to accommodate packet operating in the Region 3 Band Plans.

Working hours:

Tuesday 2030 - 2220
Wednesday 1330 - 1500

Procedures:

The band plans developed at the Auckland Conference were reviewed.

New band plans for the 1.8 MHz and 3.5 MHz bands were developed.

The need for band plans for bands above 1300 MHz was considered.

The revised band plans for conference consideration are included here. Provisions for packet are included.

The Region 1 representative wished to have his great concern recorded for the wide divergence in the band plans for packet by Region 3 from those recently decided by Region 1.

FOR: ARRL, JARL, KARL, MARTS, PARA, PARS, RSGB, SART, WIA.
AGAINST: nil.
ABSTAIN: RAST, CRSA.
Passed.

REGION THREE BAND PLANS

The Basic Principles underlying the Region 3 Band Plan:

1. In all cases of conflict between a band plan and the national regulations of a country, the latter shall prevail.

2. Nothing in these band plans shall be construed as prohibiting different national arrangements, provided that harmful interference is not caused to stations in the countries operating in accordance with the regional band plan.

3. Notwithstanding item 2 above, member societies of Region 3 are strongly urged to use these regional band plans as a basis for their national band plans.

PLEASE NOTE:

Phone operation includes SSTV, FAX and modes with similar bandwidths not exceeding 6 kHz.

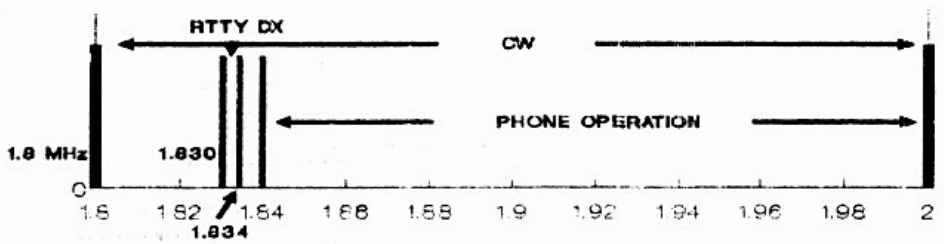
NB is narrow band modes including CW, RTTY, Packet and modes with similar bandwidths not exceeding 2 kHz.

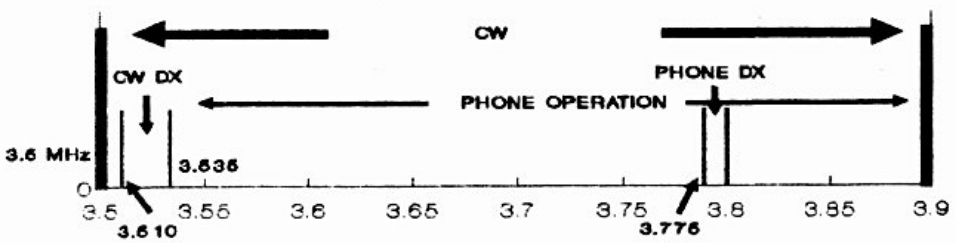
WB is wideband modes including FM.

Segments marked SATELLITE should be kept clear of other operating modes.

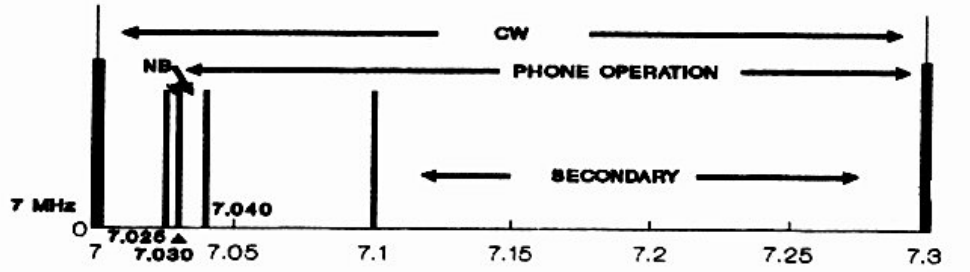
EME includes other weak-signal propagation modes, ie, Meteor Scatter and Auroral Scatter.

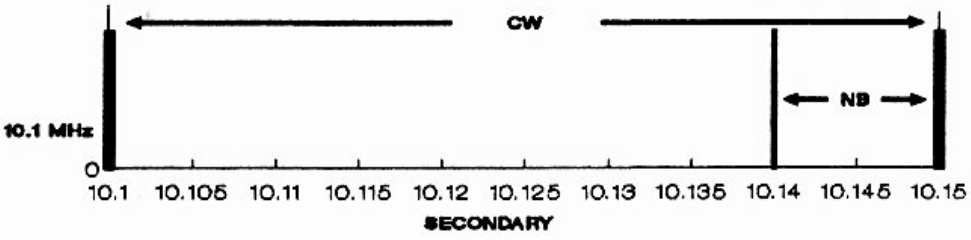
Secondary at 7.1 to 7.3 MHz means that amateur stations shall not cause harmful interference to stations of the Broadcasting Service.

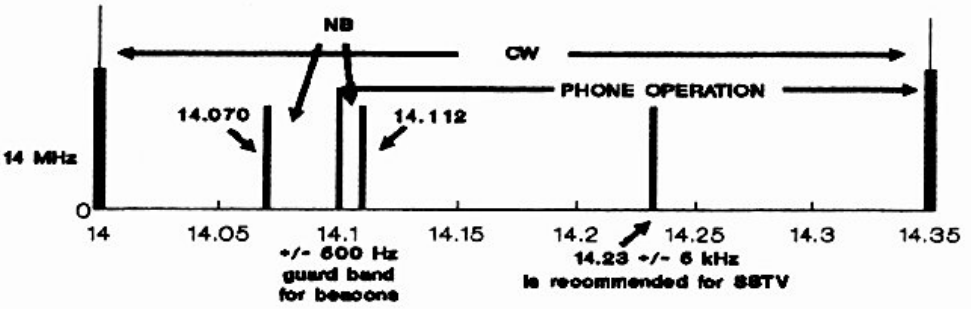




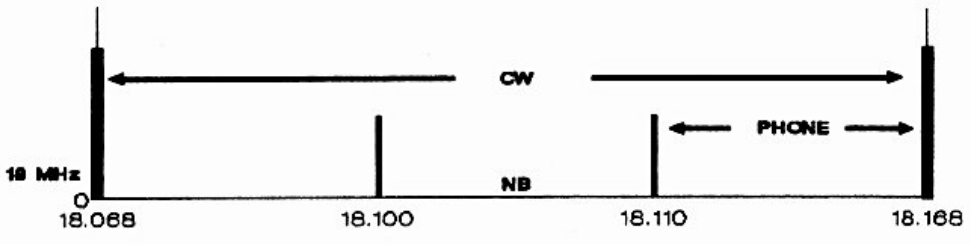
Note: Where the total band available nationally is 100 kHz or less, phone operation may commence at 3.525 MHz.

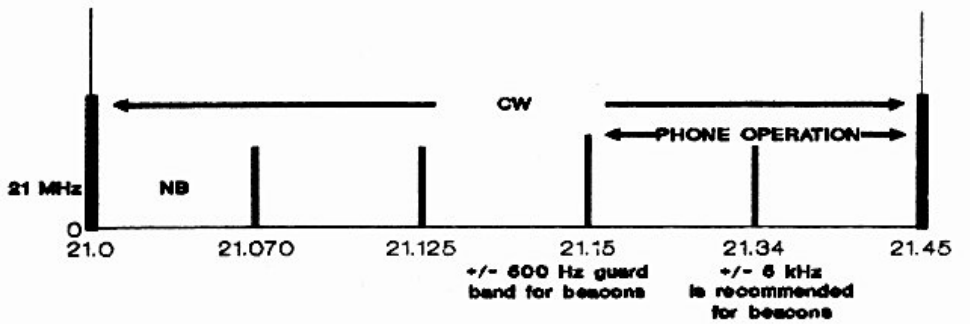






Note: Considering the dramatic increase in data mode usage on the 20 metre band, it is recommended that the sub-band for these classes of signals be 14.070 MHz to 14.112 MHz (with ± 500 Hz at 14.100 for beacons), and within that data sub-band the current practices of traditional data modes may continue up to 14.095 MHz with 14.095 to 14.112 MHz being reserved for other data modes including packet.





REPORT OF PACKET RADIO WORKING GROUP (WG 1-P)

Convener: Ron Henderson VK1RH

Members:

Calvin White HL9EP
Daishichiro Iida JI1XHU
Jay Holladay W6EJJ
Moeis Tjondro YB1CPT
Bob Knowles ZL1BAD
David Tan 9M2DT
Jayaram 9V1VS

Terms of Reference:

1. To review current developments in packet radio techniques.
2. To consult with working groups on band plans, and
3. To report to and recommend to the conference any changes needed to Region 3 documents and policies to assist the development of packet radio in this region, including consideration of third party message matters associated with packet radio.

Relevant Papers:

Papers

19	Report from Region 1.
37	Use of Packet Radio to Improve Inter-Society Communication.
61	Third Party Traffic Status.
66	Packet Radio in Australia.
68	Information Exchanges on Packet Bulletin Boards.
69	Packet Radio on HF.
71	IARU AC Resolutions.
81	Packet Radio Regulations.
87	Packet Radio on 14 MHz.
89	International Aspects of Packet Radio.
98	Packet Radio Korea.

Working hours:

Tuesday 2030 - 2230
Wednesday 1330 - 1600
Thursday 1330 - 1430

CURRENT DEVELOPMENTS

The Working Group, in its discussions as a prelude to recommending band plan changes to WG 1, made the following observations.

a	The increasing demand for data mode band space.
b	Band planning needs to be dynamic yet have stability; hence the recommendations of this conference should have a life span until at least the next regional conference, when evolving techniques may lead to revision.
c	The inappropriateness of the presently used designators "RTTY" and "Narrow Band Modes" to describe what are data communications.
d	The expression "HF Packet" describes F1D transmissions.
e	HF packet is utilised for two differing purposes; for real time QSOs and for data networking including BBS operations.
f	Flexibility must be maintained to permit continued experimentation with modems, shift frequencies, protocols, etc.

RECOMMENDATION 1

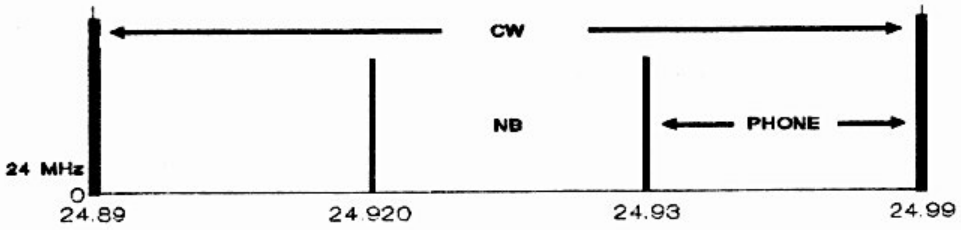
The WG identified the activities listed in note form in Annex A as warranting further investigation by packet researchers and developers.

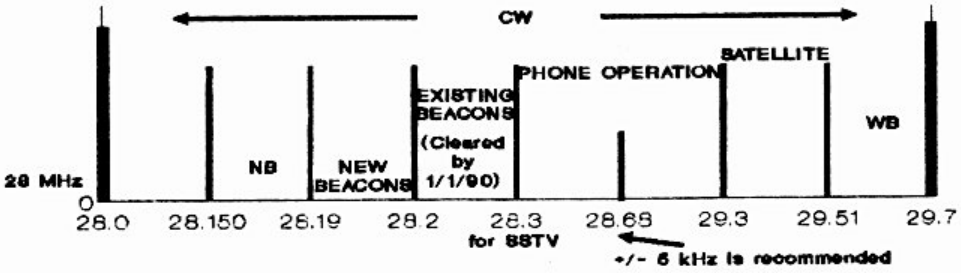
BAND PLANS

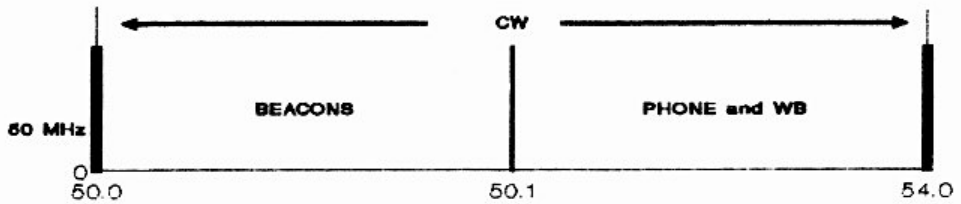
The WG examined all Region 3 Band Plans from 1.8 to 30 MHz and made the following recommendations to WG 1 (Recommendations 2).

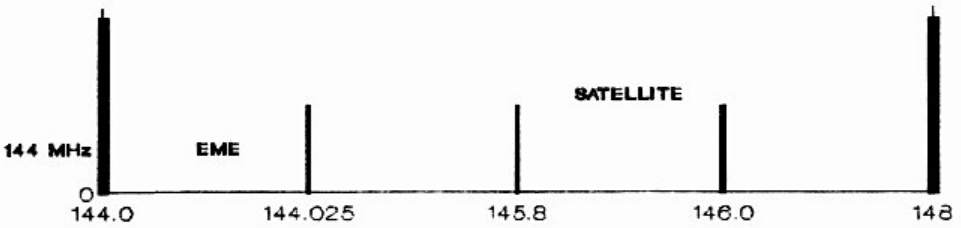
MHz

1.8	No recommendation
3.5	No recommendation
7	Data sub-band 7.025 - 7.040 MHz

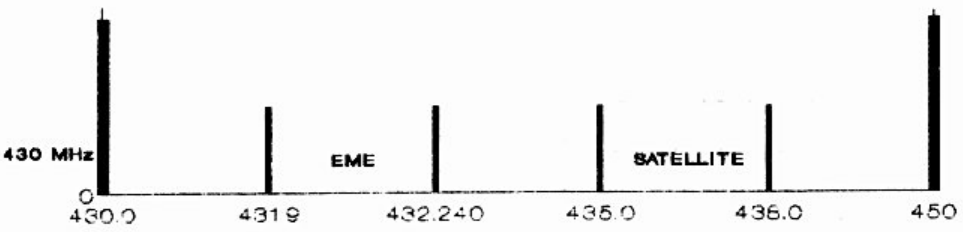


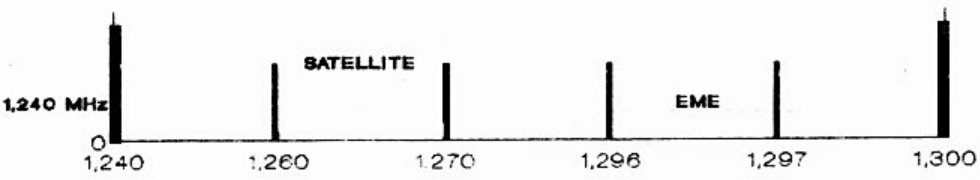






Note: No provision is made for satellite uplinks in the lower portion of the 144 to 148 MHz band because of lack of information.





Bands above 1300 MHz: Societies should consult with the amateur satellite community for proposed satellite operating frequencies before deciding local band plans above 1300 MHz.

10 Data sub-band 10.140 - 10.150 MHz
14 Data sub-band 14.070 - 14.112 MHz
18 Data sub-band 18.100 - 18.110 MHz *
21 Data sub-band 21.070 - 21.125 MHz *
24 Data sub-band 24.920 - 24.930 MHz *
28 Data sub-band 28.050 - 28.150 MHz *

* denotes no change from Auckland 1985 Band Plan.

The WG was desirous of not stipulating mandatory emission mode segments, within sub-bands, however the following footnote to the 14 MHz band plan was provided for guidance of regional societies in formulating any "Gentleman's Agreements".
(Recommendation 3)
Considering the dramatic increase in data mode usage on the 20 metre band, it is recommended that the sub-band for these classes of signals by 14.070 to 14.112 MHz (with ± 500 Hz at 14.100 MHz for CW beacons) and within that data sub-band the current practices of traditional data modes may continue up to 14.095 MHz with 14.095 to 14.112 MHz being reserved for other data modes including packet.

In making these recommendations, the WG was mindful of IARU AC 86-2. However they were of the opinion "market forces" applied and their wish was to both provide additional data mode spectrum yet contain that extension.

Further they are of the opinion these actions conform with the wider application of the Resolution.

CHANGES TO ASSIST THE DEVELOPMENT OF PACKET RADIO THIRD PARTY COMMUNICATIONS

On the matter of third party communications, the WG draws the following recommendation to the attention of Working Group 2 (Recommendation 4).

Urge members societies to make representations to their administrations to permit the retransmission of information received from other amateur stations and that such reception and retransmissions of amateur originated information be not treated as third party traffic as referred to in para 2733 of the Radio Regulations.

PROLIFERATION OF BBS

The Working Group noted the experience o many societies with the proliferation of BBS in the initial "flush of enthusiasm".

It is recommended: (Recommendation 5A)
To ensure the orderly growth of the packet mode the establishment of BBS should be co-ordinated. Such co-ordination to be the responsibility of each national society within its country and that where the transmissions of any VHF/UHF BBS have the potential to cross national boundaries the establishment of any BBS shall be co-ordinated by the member societies likely to be affected. It is further recommended; (Recommendation 5B).

That each society attempt to limit the number of HF BBS operating from their country to the minimum number necessary.

ACCESS TO THE PACKET NETWORK

The Working Group observed the desirability of retaining a simple means of access to the packet radio network by newcomers, using relatively unsophisticated stations.

Interoperability of systems, though interfaces as necessary, was considered an essential objective.

It is recommended; (Recommendation 6).

Access to the packet radio network be achievable using relatively unsophisticated stations.

CHANGES TO REGIONAL POLICIES

Changes to Region 3 Band Plans, as developed at Auckland 1985, have been identified in Recommendations 2 and 3 and passed to WG 1 for incorporations.

Clarification of the meaning of third party communications has been identified in Recommendation 4 and passed to WG 2 for development.

Adoption of this report on the 14 MHz band plan of WG 1 does not signify Region 3's disassociation from IARU AC 86-2, but rather its continued considered application.

ANNEX A FUTURE PACKET RADIO DEVELOPMENTS

The following areas should be considered in future development of packet radio techniques.

MODEMS — Improved modulation techniques, to achieve greater data rates for given occupied bandwidths.

PROTOCOLS — Link layer improvements.

— Networking/trunking with improved through puts.

— Development of a compatible hierarchy of BBS for a wide range of user conditions.

SYSTEM CONTROL — Station integration using microprocessors.

— Automatic operation on 24-hour basis.

— Development of adequate safeguards to shutdown stations.

SYSTEM PERFORMANCE and OPTIMISATION — Kiss TNC development.

— Performance analysis and reporting.

SOFTWARE — Encourage the co-ordination of developments to ensure compatibility, avoid duplication, inform others and spread scare resources.

— Encourage the release of source codes.

PLENARY DISCUSSION

MARTS — sees value in recommendations.

ADOPTION

M: WIA

S: ARRL

NZART — Recommendation 4 — sees it as a Recommendation to WG 2.

RSGB — Requests reservation be noted as data above 14.100 MHz not supportable by RSGB.

FOR: WIA, SIRS, SARTS, ORARI, NZART, MARTS, JARL, RSGB, CSRA, ARRL +1.

AGAINST: —

ABSTAIN: —

Carried.

REPORT FROM WORKING GROUP 2

Convener: David Wardlaw VK3ADW

Members:

Richard Baldwin W1RU
Shozo Hara JA1AN
R J Hughes G3GVV
Peter Lake ZL1AIZ
Michael Owen VK3KI
David Rankin 9V1RH
Alberto Shaio HK3DEU
David Sumner K1ZZ
Yoni Sutjahjono YB0DLG
Louis van de Nadort PA0LOU

Terms of Reference:

1. The position in preparation of a position for the Amateur Service and the Amateur Satellite Service in respect of frequency and regulatory matters,
2. The means to advance the position of the Amateur Service and the Amateur Satellite Service, including representation, education and materials for such purpose, and
3. To report and make recommendations to this conference for actions needed to be taken by the Region 3 Association and its member societies.

Relevant Papers:

Document No 88/VII/

20 Preparation for a future ITU Conference — Mr Baldwin.
22 Band Allocations for Region 3 and the Next General WARC — Directors.
26 IARU Funding and Financing — NZART.
35 The New Zealand Amateur Band at 610 to 622 MHz — NZART.
40 Planning Towards the Use of the Radio Spectrum in the 21st Century by the Amateur Service — NZART.
41 Deregulation and Sale of the Radio Spectrum — NZART.
45 International Communications in Emergencies — NZART.
53 Preparation for WARC Frequency Allocation — WIA.
71 Administrative Council Resolutions 84-6, 84-4, 77-1 — Admin Council.

Document No 85/VI/89, page 7 — Administrative Council Suggestions for Consideration by the Regions in Connection with a Possible Future WARC.

ADOPTION:

M WIA
S JARL

Carried. U.

ACTION: The Working Group developed the following document and submits it to the conference as its recommended plan for achieving frequency allocation and regulatory objectives of the Amateur Service and the Amateur Satellite Service at future ITU World Administrative Radio Conferences.

PLANNING FOR THE AMATEUR SERVICE AND AMATEUR SATELLITE SERVICE

Growth in numbers of radio amateurs and increased diversity of their operations make further extensions of frequency allocations necessary. Both communicators and technical experimenters should be encourages. Technical innovation, experimentation and scientific involvement as a whole service should be fostered.

The value of the Amateur Service and the Amateur Satellite Service as a natural disaster communications relief resource should be emphasised.

Because radio amateurs are capable of a considerable degree of self-administration, these benefits can be gains without placing an undue burden on national administrations.

A. GENERAL OBJECTIVES

1 The Amateur Service and Amateur Satellite Service should retain the existing general objectives of personal intercommunication, self-training and technical investigations.
2 Operations should be by duly authorised people for personal interest, self-education, scientific research, and without financial regard or gain.0
3 The availability of a "common licence" should be encouraged.
4 Administrations should be encouraged to propose and support resolutions in favour of the Amateur Service and the Amateur Satellite Service at World Administrative Radio Conferences and at other ITU meetings and forums.
5 Efforts should continue, to develop the technical, educational, and social contribution that is made to the world community and to international relations by amateur radio.
6 The retention of Morse code requirements should be encouraged for operation below 30 MHz.

B. SPECTRUM ALLOCATION NEEDS

1. Allocations below 30 MHz

a) Retain present allocations, including Amateur Satellite operation in all bands allocated exclusively to the Amateur Service.

b) Access to a narrow band for experimentation in the vicinity of 190 kHz (noting the existence of a band edge in Region 1 at 148 kHz).

c) Exclusive world-wide allocation of 100 kHz in the vicinity of 1.8 MHz, and retention of additional shared allocation of 100 kHz in Regions 2 and 3.

d) Exclusive world-wide allocation of 300 kHz at 3.5 MHz, and retention of additional shared allocations in Regions 2 and 3 (200 kHz in Region 2, 100 kHz in Region 3).

e) Shared primary world-wide allocation at 5.005 to 5.060 MHz.

f) Exclusive world-wide allocation of 300 kHz at 7 MHz, with elimination of footnotes permitting Fixed Service operation and retention of resolution prohibiting broadcasting from the world-wide amateur band.

g) Exclusive world-wide allocation of 250 kHz at 10.1 MHz.

h) Exclusive world-wide allocation of 400 kHz at 14 MHz, with elimination of footnote permitting Fixed Service operation.

i) Exclusive world-wide allocation of 250 kHz at 18.068 MHz.

j) Retention of exclusive world-wide allocation of 450 kHz at 21 MHz.

k) Exclusive world-wide allocation of 250 kHz at 24.74 MHz.

l) Retention of exclusive world-wide allocation of 1.7 MHz at 28 MHz.

2. Allocations between 30 Mhz and 10.5 GHz

a) Retention of 50-54 MHz in Regions 2 and 3, and provision of exclusive band of 500 kHz and shared band of another 1.5 MHz in Region 1.

b) Retention of 144-146 MHz as a world-wide Amateur and Amateur Satellite band, with elimination of footnotes allowing operation by other services in some countries; retention of 146-148 MHz in Regions 2 and 3, and addition of 146-148 MHz as a primary shared band in Region 1.

c) Retention of 220-225 MHz as a primary, shared amateur band in Region 2 and addition of an allocation in Regions 1 and 3.

d) Establishment of 430-440 MHz as a world-wide exclusive Amateur and Amateur Satellite band, with continued sharing of 420-430 and 440-450 MHz where now permitted; deletion of footnotes permitting fixed and mobile operation at 430-440 MHz.

e) Retention of footnote 691 (610-622 MHz on a secondary basis).

f) Retention of 902-928 MHz as a secondary amateur band in Region 2, with 902-905 MHz elevated to primary

status and added, where possible, in Regions 1 and 3.

g) Retention of existing band at 1240-1300 MHz, including Amateur Satellite bidirectional (not limited to uplink only) at 1260-1270 MHz, with 1260-1300 MHz elevated to primary status; deletion of footnotes permitting fixed and mobile operation at 1260-1300 MHz.

h) Retention of existing band at 2300-2450 MHz, including Amateur Satellite allocation at 2400-2450 MHz, with 2390-2400 MHz elevated to primary status.

i) Retention of existing band at 3300-3500 MHz in Regions 2 and 3; addition of 3400-3475 MHz in Region 1; world-wide Amateur Satellite allocation at 3400-3410 MHz (presently Regions 2 and 3 only); 3400-3420 MHz elevated to primary status.

j) Retention of existing band at 5650-5925 MHz where presently allocated, including Amateur Satellite uplink at 5650-5670 MHz and downlink at 5830-5850 MHz; 5760-5762 MHz elevated to primary status.

k) Retention of existing band at 10.0-10.5 GHz, including Amateur Satellite band at 10-45-10.5; 10.35-10.5 GHz elevated to primary status.

3 Allocations above 10.5 GHz

a) Retention of all existing allocations.

b) New shared allocations coinciding with any newly created ISM bands.

c) Shift ISM centre frequency from 24.125 GHz to 24.15 GHz.

d) Upgrade secondary allocations at 76-81 GHz, 144-149 GHZ and 241-248 GHz to primary.

e) Upgrade 119.98-120.02 GHz from secondary to primary; expand if possible.

4. Extend footnote 510 to include all amateur bands between 1.8 MHz and 2450 MHz.

5. Delete certain footnotes which impinge upon the operation of the Amateur Service and Amateur Satellite Service in Region 3 (see Doc No 88/VII/22).

C. REGULATORY MATTERS

2733 of the Radio Regulations provides:

(2) it is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties.

Techniques such as packet radio, used internationally, may be inhibited by some administrations on the basis of this provision.

There are three possible solutions.

1. One of for administrations to interpret 2733 as not inhibiting communications between amateur station, whether directly or through intermediate stations. This is the preferred course, and is justified as being a correct interpretation given the context and the intent of the provision.

The second and third solutions involve seeking amendment to the Radio Regulations.

2. Article 1, Section V of the Radio Regulations could include a definition, for example as follows:

Third Party (in the Amateur Service and Amateur Satellite Service); Any party other than a person licenced to operate the apparatus of an amateur station.

The advantage of this course may be that it is easier to seek the inclusion of a definition than to seek a review of Article 32.

3. However, if Article 32 was to be reviewed, amendment to 2733 could be sought, for example by adding:

. . . on behalf of third parties, other than a third party who is a person licenced to operate the apparatus of an amateur station.

The Administrative Council is requested to keep this matter under review.

D. ACTIONS REQUIRED IN SUPPORT OF THESE OBJECTIVES

1. Member societies should request that their administrations submit proposals advancing these objectives to relevant ITU Conferences and CCIR Meetings.
2. Member societies should request that their administrations support such proposals when advanced by other administrations.
3. Member societies should seek to have a suitably qualified representative of the Amateur Service and the Amateur Satellite Service included in their national delegations to ITU Conferences and Meetings having matters of relevance to our societies on their agendas. This may require the member societies to make appropriate provisions for funding of such representatives.
4. Member societies should seek to develop relationships with key persons in ITU affairs and to ensure that these persons are fully briefed on amateur matters.
5. Member societies are urged to keep the Secretary, Region 3, fully apprised of preparations underway in their country.
6. The actions of the 6th Regional Conference in adopting Motions 9-J/1, 9-J/3 and 9-J/4 are hereby reaffirmed. Particular note should be taken of Resolution 9-J/4 with respect to continued participation in the work of the CCIR.

ar

Try This!

Andrew Hay VK7ZHA
19 Morgan Court, Davenport, Tas. 7310

SOLID STATE CONVERSION OF LEADER LSG11 SIGNAL GENERATOR

Many years ago, the LSG11 was available as an inexpensive, simple and very popular signal generator.

There must be many of these units still about. Some have probably already been converted to solid-state operation. For the rest that haven't the circuit in Figure 1 and this brief description may motivate you to try solid-state conversion.

Firstly, the unit is stripped of all of the valve associated components, leaving only the front panel controls and the L/C components intact. The function switch on the front panel (EXT, 400 Hz, 1000 Hz, XTAL) is then removed and replaced with a four-pole, three-position switch.

Whilst all construction was done on tag strips, a printed circuit board could be used if desired. With careful preparation, a successful conversion can be done in about three hours.

The power supply transformer was a 12 V/200 mA unit that was bought for $5. The total cost of the conversion was less than $20.

With the conversion done, the original calibration should be close enough,m the original functions will be still intact and the unit should provide useful harmonics up to 500 MHz.

ar

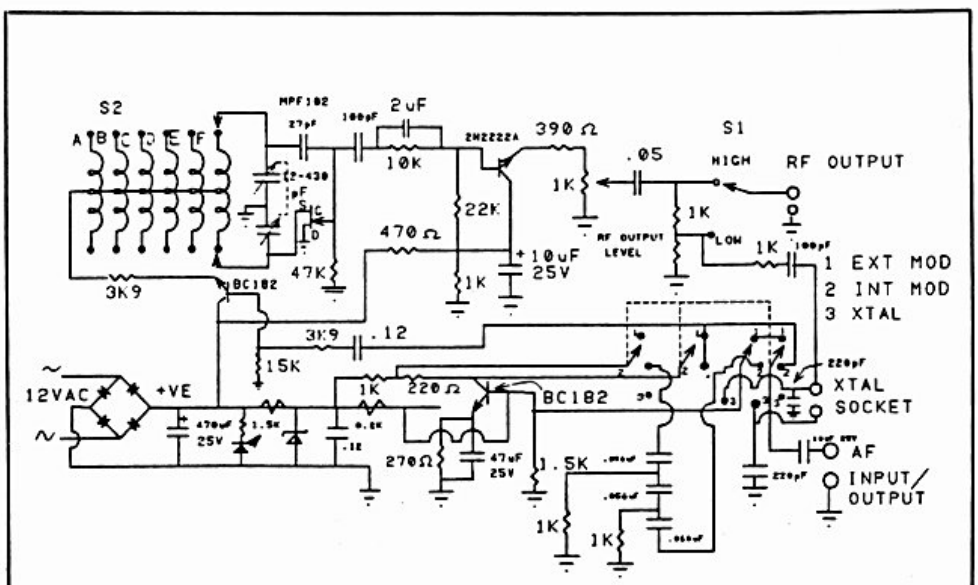


Figure 1: FET Circuit suitable to convert a Leader LSG11 to Transistor Operation.

1988 INDEX OF ARTICLES by months

ELECTROMAGNETIC COMPATIBILITY

EQUIPMENT REVIEWS

FUTURE OF AMATEUR RADIO

MINI-PROJECTS

NOVICE NOTES

POWER SUPPLIES

TECHNICAL ARTICLES

TELETYPE

TRANSCEIVERS, TRANSMITTERS & RECEIVERS

TRY THIS

WICEN

1988 INDEX OF ARTICLES alphabetical

ELECTROMAGNETIC COMPATIBILITY

EQUIPMENT REVIEWS

FUTURE OF AMATEUR RADIO

MINI-PROJECTS

NOVICE NOTES

POWER SUPPLIES

TECHNICAL ARTICLES

TELETYPE

TRANSCEIVERS, TRANSMITTERS & RECEIVERS

TRY THIS

WICEN

TOPICAL TECHNICALITIES

Lindsay Lawless VK3ANJ
PO Box 112, Lakes Entrance, Vic. 3909

The secret of good and efficient 'digital communication' is economy of digits. Digital communication is communication with messages enciphered, then encoded with electrical impulses representing the numbers of the cipher. That total process is usually referred to as encoding.

The message originator encodes information with the numbers (digits) of a selected number system and supplies the receiver with a decoder to retrieve the original information. Between the information encoder and the information decoder there may be additional processes necessary to translate the code to electrical signals and to modulate and demodulate a 'bearer'.

Information can be discrete like the characters of a typewriter keyboard or continuous like speech waveforms and analogue meter readings. It is necessary to convert continuous information to discrete form by "sampling' and 'quantising'; which simply means to sample the information at intervals, measure the sample magnitude and express that as a number; ie a group of digits.

To encode discrete information, N digits from a number system with radix X are required and X^N is the number of discrete elements in the information. A 1000 volt digital meter for measuring 0 to 999.9 volts in increments of 0.1 volt requires 10 000 decimal numbers for the 10 000 possible messages. The radix (X) is therefore 10 and N = 4; ie

$$M = 10^4 = 10\,000 \text{ and}$$
$$N_{10} = \log_{10} 10\,000 = 4 \text{ digits}$$
$$\text{generally } N_x = \log_x M \text{ digits} \quad \ldots (1)$$

M is the number of information elements required. Any number system could be used to encode the information, a radix 8 system (octal) for example would require:

$$N_8 = \log_8 10\,000 = 4.43 \text{ octal digits.}$$

0.43 of a digit is impossible — five octal digits are required.

A radix 2 (binary) system would need:

$$N_2 = \log_2 10\,000 = 13.29 \text{ bits — use 14.}$$

Because $2^{14} = 16\,384$ there would be 6 384 redundant numbers which is a waste of bits if the redundancy can't be used for other purposes.

To find the logarithm to the base x use:

$$\log M = \log_{10} M / \log_{10} x$$

example

$$\log_{10} 10\,000 / \log_{10} 8 = 4/0.9 = 4.43$$

A meter with 10 000 increments each 0.1 volt is designed for situations which demand that resolution and for the expectation that all 10 000 have equal probability. The probability (p) is 0.0001 and (1) can be modified to:

$$N = \log. 1/p \ldots (2) \text{ or}$$
$$N = -\log p \ldots (3)$$

Equations (2) and (3) reveal the importance of message element probability and provide the clue to achieving digit economy.

N can be reduced by deliberately increasing p: for example, if the number of increments can be reduced from 10 000 to 1000 (p = 0.001) the decimal digits can be reduced to three and binary digits from 14 to 10. Binary redundancy is reduced also.

A better result can be achieved by range switching; for example, if it is certain (p=1) that a measurement will be higher than 200 volts and very rarely (p→0) exceed 300 volts — a volt meter range 200 to 300 volts will be suitable. Three only decimal display digits will be required and the binary information transfer will need only 10 bits. The accuracy remains at 0.1 volt.

That economy may not be necessary or desirable for a laboratory or workshop bench meter but if the task is too remote the measurement (telemetry) the saving permits a reduction of lines in a parallel transfer highway and reduced bandwidth or higher signalling speed in a serial transfer system.

Scientists and engineers, for very good reasons, want to measure and express what they are talking about in numbers, and information is no exception. In 1948, Claude Shannon of the Bell Laboratories, showed how well to do that. The above rough analysis of a practical problem illustrates the connection between probability and information value. The number of digits required to encode an information element depends on it's probability and it's information value. The equations (2) and (3) can be rewritten to read:

$$I = -\log_x p \text{ information units.}$$

If X is 2 the information unit is the 'bit' and if X is 10 the unit is the Hartley, if X = e the unit is the nat, so named because e is the base of 'natural' logarithms. The practical unit for present technology is the bit, but other possibilities should be kept in mind. Most messages contain elements with different information values, it is necessary to know the average information. The total information is:

$$I = np_1 \log 1/p_1 + np_2 \log 1/p_2 + \ldots np_n \log 1/p_n \quad \ldots (4)$$

n is the number of elements. The average information is I/n or H. Therefore:

$$H = p_1 \log 1/p_1 + p_2 \log 1/p_2 \ldots \text{etc} \quad \ldots (5)$$

If no attempt is made to optimise information, the spread of value about the average will be substantial and it is worthwhile endeavouring to reduce that spread. Speech dynamic range compression is one example, bandwidth compression is another. The information value in the letters of the alphabet ranges from approximately three bits to 10 bits. Telegraphists intuitively optimised information value by abbreviations.

Mostly, the choice is between fidelity and information value — the former requires words of many bits to suit the highest information value and this usually means large redundancy. The latter will sacrifice fidelity and use source range compression and word length optimisation related to information value.

Photographic quality is a good example of the difference between fidelity and information value. A large format photograph is artistically satisfying but 110 size format enlarged is just as informative using a fraction of the picture elements.

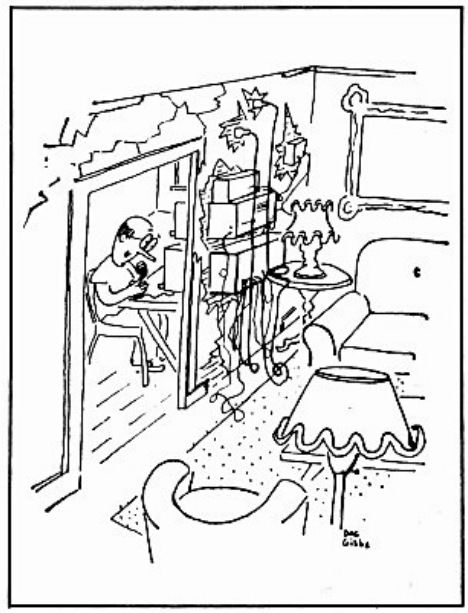
Another consideration is the resolution of the information source: if the resolving power of the lens is two minutes of angle (equivalent to that of the eye) it is a waste of digits to provide for better resolution in the information transfer system.

The above foray into the realms of information theory is presented as a rough introduction to the subject in the hope that our digital buffs will spare some time from their VDU gazing and examine the basic philosophy without which true understanding is not possible.

Recommended References

Principles of Communications Systems. Taub and Schilling.
Reference Data for Radio Engineers. ITT.
Fundamentals of Computer Science. A J T Cronin.

ar



—Cartoon Contributed by Gil Griffith VK3CQ

"And, Honey, wait til you see the shack. I've built the equipment into the wall."

$120 CHRISTMAS GIFT FROM EMTRONICS

WITH EVERY HF TRANSCEIVER KENWOOD, ICOM OR JRC YOU WILL RECEIVE THE NEW TET-EMTRON.

MV-3

THREE BANDS (10.15 AND 20 METRES) VERTICAL ANTENNA WORTH $120

ABSOLUTELY FREE!

THIS OFFER IS VALID FROM DEC. 1, 1988 UNTIL JAN 31, 1989

MV-3

TET-EMTRON'S NEW HB-31

ROTATABLE 3 BAND (10.15 & 20M) DIPOLE THE IDEAL ANTENNA FOR HAMS WITH LIMITED SPACE AND BUDGET. ONLY **$169**

ROTATORS

- KR 400 in stock
- KR 800 in stock
- KR 2000 in stock
- KR 500 in stock
- KR 5400 in stock
- KR 050 stay bearing
- KR 065 stay bearing
- KR 400 in stock
- DIAWA MR 750 due Sept.
- DIAWA MR 7504 motor in stock

8 core Rotator Cable now in Stock

GO MOBILE with NEW **EM-5** EMTRON'S UNIQUE HF MOBILE ANTENNA

Featuring 80 metre adjustable bandspread full leagl power on all bands.
Five bands on one antenna. Tapered Fibreglass **$189**

NEW 1989 CATALOGUE OUT NOW!

THIS 68 PAGE CATALOGUE WILL MAKE YOUR MIND "BOGGLE"!

MANY EXCITING NEW PRODUCTS NOT SEEN IN AUSTRALIA BEFORE. SOME JUST RELEASED.

ORDER YOUR COPY IMMEDIATELY!

SEND $2.00 FOR YOUR HOME DELIVERY

AR CATALOGUE ORDER FORM CUT HERE

PLEASE SEND MY COPY OF EMTRONICS NEW 1989 RADIO COMMUNICATIONS CATALOGUE

NAME .....

ADDRESS .....

POSTCODE .....

ICOM

ALL ICOM PRODUCTS, COMMERCIAL AND AMATEUR ARE AVAILABLE FROM EMTRONICS

Contact us for Australia's most competitive prices!

KENWOOD

FULL RANGE OF ALL KENWOOD PRODUCTS AVAILABLE AT COMPETITIVE PRICES FROM OUR 3 STORES! ! !

JOIN THE PACKET REVOLUTION!

New PK-232 Breakthrough

A new software enhancement makes the AEA PK-232 the only amateur data controller to offer six transmit/receive modes in a single unit.

★ Morse Code ★ BAUDOT (RTTY) ★ ASCII ★ AMTOR ★ Packet ★ Weather FAX

PRICE $649 WITH FAX

NEW

PK-88 ™ PACKET CONTROLLER NOW $299

The PK-88 is not just another copy, it is much more. With all the packet program features of the Multi mode PK-232, the PK-88 is an economical new TNC designed to bring you enhanced completely compatible packet software plus new hardware features for improved packet operation.

BANKCARD MASTERCARD & VISA WELCOME

EMTRONICS

MAIL ORDERS WELCOME

NSW & HEAD OFFICE:
92-94 Wentworth Ave, Sydney
NSW. 2000. TLX:AA73990
P.O. Box K21 Haymarket, NSW. 2000
Ph: (02) 211 0988
FAX: (02) 281 1508

VICTORIA:
288-294 Queen St, Melbourne
Vic. 3000
Entrance from Lt. Lonsdale St.
Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120
Ph: (07) 394 2555
FAX: (07) 394 4316

Eric Jamieson VK5LP
9 West Terrace, Meningie, SA. 5264

VHF UHF — an expanding world

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	**H44HIR**	*Honiara*
50.011	**JA2IGY**	*Mie*
50.020	**JE6ZIH**	*Japan*
50.028	**JA7ZMA**	*Fukushima City*
50.032	**ZD8VHF**	*Ascension Island* [1]
50.066	**VK6RPH**	*Perth*
50.075	**VS6SIX**	*Hong Kong*
50.080	**KH6JJK**	*Hawaii*
50.110	**BY4AA**	*China*
50.490	**JG1ZGW**	*Tokyo*
51.020	**ZL1UHF**	*Auckland*
52.013	**P29BPL**	*Port Moresby*
52.100	**ZK2SIX**	*Niue*
52.200	**VK8VF**	*Darwin*
52.250	**ZL2VHM**	*Manawatu*
52.320	**VK6RTT**	*Wickham*
52.325	**VK2RHV**	*Newcastle*
52.330	**VK3RGG**	*Geelong*
52.345	**VK4ABP**	*Longreach*
52.370	**VK7RST**	*Hobart*
52.420	**VK2RSY**	*Sydney*
52.425	**VK2RGB**	*Gunnedah*
52.435	**VK3RMV**	*Hamilton*
52.440	**VK4RTL**	*Townsville*
52.445	**VK4RIK**	*Cairns*
52.450	**VK5VF**	*Mount Lofty*
52.460	**VK6RPH**	*Perth*
52.465	**VK6RTW**	*Albany*
52.470	**VK7RNT**	*Launceston*
52.485	**VK8RAS**	*Alice Springs*
52.510	**ZL2MHF**	*Mount Climie*
144.022	**VK6RBS**	*Busselton*
144.400	**VK4RTT**	*Mount Mowbullan*
144.410	**VK1RCC**	*Canberra*
144.420	**VK2RSY**	*Sydney*
144.430	**VK3RTG**	*Glen Waverley*
144.445	**VK4RIK**	*Cairns*
144.445	**VK4RTL**	*Townsville*
144.465	**VK6RTW**	*Albany*
144.470	**VK7RMC**	*Launceston*
144.480	**VK8VF**	*Darwin*
144.485	**VK8RAS**	*Alice Springs*
144.550	**VK5RSE**	*Mount Gambier*
144.600	**VK6RTT**	*Wickham*
144.800	**VK5VF**	*Mount Lofty*
144.950	**VK2RCW**	*Sydney*
144.950	**VK3RCW**	*Melbourne*
145.000	**VK6RPH**	*Perth*
432.066	**VK6RBS**	*Busselton*
432.160	**VK6RPR**	*Nedlands*
432.410	**VK1RBC**	*Canberra*
432.420	**VK2RSY**	*Sydney*
432.440	**VK4RSD**	*Brisbane*
432.445	**VK4RIK**	*Cairns*
432.445	**VK4RTL**	*Townsville*
432.450	**VK3RAI**	*Macleod*
432.535	**VK3RMB**	*Mount Buninyong*
432.540	**VK4RAR**	*Rockhampton*
1296.198	**VK6RBS**	*Busselton*
1296.410	**VK1RBC**	*Canberra*
1296.420	**VK2RSY**	*Sydney*
1296.440	**VK4RSD**	*Brisbane*
1296.445	**VK4RIK**	*Cairns*
1296.480	**VK6RPR**	*Nedlands*
2304.445	**VK4RIK**	*Cairns*
2306.440	**VK4RSD**	*Brisbane*
10368.000	**VK3RGZ**	*Pretty Sally Hill* [2]
10445.000	**VK4RIK**	*Cairns*

1 According to news from South Africa, this beacon is in continuous operation. Ascension Island is about eight degrees south of the Equator and midway between Africa and South America.

2 John VK3ZJC, advises that the 10 GHz beacon VK3RGZ has been built and licensed and should be operating from Pretty Sally Hill, north of Melbourne, by the time you read this. Frequency is 10368.000, plus or minus 20 kHz. Power is about 250 mW and this will be fed into two antennas, one of which will be a 30 dB dish aimed at VK7. The identification is MCW and will alternate between narrow and wide deviation. The beacon was apparently made by Andrew VK3KAJ, and tested by Les VK3ZBJ.

John also confirms the operation of VK3RMB on 432.535 MHz. It runs a continuous carrier with FSK identification every 30 seconds. John says the beacon is S9 at his location, 120 kilometres distant, while VK3RAI, 16 kilometres away is S7.

Readers will note that the beacon ZS2SIX, on 50.005 MHz, has been removed from the list. Hal Lund ZS6WB, says that it is still off the air. Apart from ZS6PW operating evenings only and beaming north on 50.014 MHz, there appear to be no active beacons on six metres from South Africa.

With the earlier closing of my notes last month, several letters arrived too late to be included. The same could happen this month, which is unfortunate, but then the January issue is always an early closing date.

DX FROM THE TIP OF AUSTRALIA

Lionel VK3NM, reports that he recently returned from a trip to far north Queensland, which took him to Weipa, Coen, etc. From there he worked a lot of six metre DX with incredible ease, using only 10 watts and a quarter wave whip antenna on the car.

From Coen he worked his first batch of JAs on TEP with signals very wobbly, like severe doppler effects. The band stayed open for many hours, it did not matter how weak signals were, he could still work the stations. At times, on first switching the rig on, the band was void of activity, but one CQ call brought in dog-piles from the far north. He said one could work a list of stations, have tea, shower, etc go back and the band would still be open. A much different story from Melbourne!

From Coen on 7/9, between 0947 and 1111 UTC, Lionel worked 23 JAs in districts 1, 2, 3, 4, 5 and 0. Signals were 5 x 9 both ways in many instances, which is exceptional considering the small antenna used. On the same day, Joe KG6DX, was heard but he was lost when he turned his antenna to work JAs.

From Laura on 8/9, JR2YCB 5 x 5, JE2QJI 5 x 4 and JL1FQJ 5 x 1 between 1034 and 1129 UTC. From Cairns o 10/9 between 0953 and 1029, 15 JAs were worked in districts 1, 2, 3, and 6 with signals varying between 5 x 9 and 5 x 1. Also from Cairns on 12/9 between 0931 and 1059, JG2BRI 5 x 4 , HL9CB 5 x 9, JH4PFU 5 x 9, JA1FHX 5 x 2, JA7JWF 5 x 9, JA3LCF 5 x 8 and JH4NRG 5 x 2.

Then from Calliope on 15/9 between 0300 and 0355, JA8TSG 5 x 3, JH7XRZ 5 x 8, JA0TPE 5 x 2, JA9MJR 5 x 7, JA8TMJ 5 x 8, JR7VTE 5 x 4, JA8GVQ/1 5 x 6, JA8JEP 5 x 9, JA2LRE 5 x 2 and JA1PVI 5 x 6.

It is interesting to note the wide variations in signal strength; also, Lionel managed to work stations in all the call areas JA1 to JA0 inclusive which is a good effort for low power and the attendant dog-piles.

Lionel mentioned the television crud from China or Russia on 49.750 was very strong on most of six metres. No signals were heard from the south during his operating periods. Thanks for writing Lionel, hope you had a good trip.

THE UNITED KINGDOM REPORT

Ken Ellis G5KW, sends a copy of his column "50 MHz" in the British *Amateur Radio* magazine which reports the first two-way QSOs between British stations along the south coast and South Africa since November 1947. G5BY and ZS1T established contact early on August 28. Warnings had been given by the South African 28 MHz beacons which resulted in a number of crossband QSOs 28/50 MHz taking place.

On 5/9, a north-south path was opened between south coast stations and Windhoek in Namibia around 1743 UTC. ZS6XJ worked eight G stations.

During August there were at least five good openings between England and ZD8 Ascension Island.

On 7/9, the all time first two-way QSO between England and South America occurred when eight G stations made contact with LU7DZ, Buenos Aires, between 2123 and 2130 UTC. The first QSO was completed by G1PAM in Plymouth. The Great Circle distance is about 11 300 kilometres or 7057 miles between G3CCH and LU7DZ, which creates a UK six metre record. G5KW says "This means that five continents have now been worked from England leaving only Australasia to be worked for 'worked-all-continents'."

On 27/9, at 1115, G5KW was alerted by telephone that the ZS6PW beacon was S9 on 50.009 MHz. Between 1130 and 1220 he worked ZS4TX/6, ZS6LW, ZS6LN, ZS6XJ. ZS6ANK and ZS6WB with signals to 5 x 9. The path was still open at 1425 when he worked ZS3AT and still open at 1850 to work ZS3E.

Ken G5KW, reports that Sweden will be granting 25 special licences for 50 MHz from November 1988. Also, SU1ER in Cairo, Egypt, will operate on 50 MHz as soon as he is able to acquire equipment. No six metre equipment is available in Egypt.

It is also possible that Finland (OH) may be granted permission to operate between 50.000 and 50.450 MHz using CW and SSB on a non-interference basis.

Mike G3SED, reports that the PJ0M DXpedition to Saba Island in the Caribbean on 9/7 worked GM3POI/A and G3SED around 2150, with both contacts being the first ever to GM and G.

SOUTH AFRICAN REPORT

Hal Lund ZS6WB, continues to send his "VHF News" reports to me and from this it is possible to gauge the measure of activity to our west and particularly in the European region — it is rather like between VK and JA except that the South Africans have a lot more countries to work, with some activity being reported from most of the western nations there.

ZS4TY has applied for permission to operate 7P8 in Lesotho. TR8DX has returned to France so there is little likelihood of six metres from Gabon. Zimbabwe recently give its amateurs permission to use six metres, but of the two stations with suitable equipment, Z21FT has moved to South Africa and Z23JO had his stations destroyed by lightning, so it will be a while before activity appears from that country.

The 9H1SIX beacon has been moved to a new QTH which is 230 metres above sea lever and runs 7.5 watts to a five eighth wave ground plane. YB3CN has a new IC-575 and is awaiting a new six

metre beam to arrive from Australia. FR5DN on Reunion Island has operating permission but no equipment. 9Q5NW has a Heath SB-110 en route from the US. 5H1HK is active from Zanzibar Island and 9H1s were heard in contact with him on 25/9 and ZS3E on 27/9. FR5EL is now active on six metres and 4X1IF has already contacted him crossband. 5B4OG has been active recently on six metres CW.

PY5ZBU in Brazil, recently contacted his 97th country on six metres and is one of the leading contenders for Six Metres DXCC No 1. A fine effort. The ARRL announced that the first five stations to qualify for the Six Metre DXCC will receive wall plaques in addition to DXCC Certificates.

The September 1988 ZS 50 MHz DX Report indicates that six metres was open every day of the month except 3/9! The month started off with weak signals to Cyprus (5B4) and Malta (9H1). On 5/9 conditions started to improve with contacts from South Africa to England and from then onwards daily contacts were available looking north.

In addition to all manner of G stations, call signs worked by South Africans during September included:
9H3IX, 9H3EN, 9H3EO, 5B4AZ, F5QT, PA3EON, SZ2DH, FC1MKY, F5GZ, CT4KQ, FC1BUU, FC1TJP, CT1DTQ, 9H1BT, 9H1IX, SV1DO, CS8LN, FC1GXV, SV0FE, 5H1HK, PA3DYS, CT1WW, plus crossband to 4X1IF, I4XCC and OK3CM.

On 27/9, JA1VOK reported that during a good opening, JR6HJ in Okinawa had F2 QSOs on six metres with Africa and South America, both probably firsts for Cycle 22. The first was on 27/9 at 1634 with 5H1HK and the second n 28/9 at 0211 with PY2BBL. The contact with Africa was after midnight JA time.

From the SOuth African report and the G5KW report, it would appear exciting times are ahead for several years for six metre operators, particularly those in well placed locations. Australian amateurs will, no doubt, share in a lot of these contacts but our geographical location dictates that we need to be vigilant if we are to share in some of the more exotic contacts.

A REPORT FROM A NOVICE

John McRae VK5NJF, of Nuriootpa in the Barossa Valley, has written to say how thrilled he was to recently be given the chance to work some JAs on six metres.

Receiving his licence in December 1987, John, being a novice licence holder, is not able to operate on six metres. However, on 21/9 he visited his friend Norm VK5ZAH, and observed him working eight JAs between 0920 and 1013 UTC, all around 5 x 9. He was most impressed. This having whetted his appetite, he returned to VK5ZAH on 7/10 and asked if he could listen on six metres. Noting the band was open to Japan he obtained permission from Norm to operate and during the next 30 minutes worked 11 JAs in 1, 3, 5 and 6 districts, with signals around 5 x 5.

He said "I was ecstatic about my first experience with six metres, giving me an increasing urge to upgrade very soon."

Good for you John, go to it! But don't leave it too long or you may miss out on some of the best contacts.

Anyway, it is encouraging to oldies like me to learn there are still some keen guys out there who can receive a thrill from DX operating on a VHF band. I offer my greatest encouragement to anyone prepared to give it a go.

THE MELBOURNE SCENE

John VK3ZJC, has written with some further news. He wished to correct a statement printed in my columns in October which said that "aircraft enhancement had provided poor contacts to Canberra and Sydney" when in fact they were good contacts. Rushing to my original copy, I noted I had said "good" but when typeset apparently "poor" was used! John also advised that the 1296 MHz calling frequency should read 1296.100 MHz.

John reports that a solar powered 10 GHz beacon is planned for the repeater site on Mount Baw Baw in Gippsland and understand Jim VK3ZYC, is working on this one.

There has been little activity on 144 and 432 other than aircraft enhancement contacts. Stations worked in Melbourne include VK1s BG, BUC, AU; VK2s BE, FG, DVZ, ZAB and ZRE. John finds that signals are often better on 432 than 144, thus resulting in more contacts, although his equipment is comparable, except that on 432 the overall electrical noise level is lower giving him a quieter noise floor.

Ross VK2DVZ, has been in Taree for the school holidays and he and David VK3AUU, have been hearing pieces of each others signals on 144.200 MHz. Nothing much from west of Melbourne, except for Maurice VK3XVB, near Bendigo and Russell VK3ZQB, in Port Fairy. Noel VK3AUG, has regular scheds with VK3BRB in Mildura.

Moss VK7IM, visited VK3 in September and stirred up interest in scatter tests between VK3 and VK7 on two metres. He lives south-east of Mount Wellington, so can only work stations east of Melbourne. He runs 400 watts on two metres and is waiting for a high power permit.

The packet operation has increased on 144.800 and the frequency is often used for speech contacts by packet operators, making it impossible to monitor VK5VF.

Roger VK3XRS, near Bairnsdale, is operational on 1296 FM with a four foot dish. Attempts to work VK3ZBJ and VK3ZJC have been unsuccessful so far, no doubt due to the inconvenient position of Mount Baw Baw in the middle of the path!

John VK3YTV and Peter VK3ZPW, now have low power transverters operating on 2304 MHz. These were made from kits which Peter brought in from England.

John VK3ZJC says he has a 576 MHz exciter for FM/AM/CW/ATV and is about to start on the power amplifier. He hopes to have the varactor multipliers ready for the summer. The 2304 MHz converter and antenna both need a final tweak and they will be ready. The antenna is a slotted array with 16 dB gain.

Over the summer holidays, John hopes to go portable through north-east Victoria, the Snowy Mountains, across to the south coast of New South Wales and back to Melbourne via East Gippsland. He would like to include operation from Mount Kosciusko, something he has always wanted to do! He plans to operate from 10 different locator squares including two which have no resident amateurs. Plans are to operate on 52, 144 and 432 at least, with some thought being given as to how to include 1296 in the operation. Depending on how the projects go, he may eventually be able to do some mountain topping on 576 and 2304 MHz.

Finally, John says there have been some angry debates on the air over the use of 144.100 for prolonged contacts. Some claim their presence on the calling frequency increases the likelihood of DX contacts, as they are providing signals on the frequency for others to hear. Obviously, others disagree, claiming they are blocking out weaker stations. The matter could be resolved to some extent if **all** the stations involved left a reasonable break between transmissions, allowing another and possibly more distant station to break in and be identified. If this is not done every time, then the stations would be better off the frequency.

From the VK5LP viewpoint, I try not to become too involved in long contacts on any calling frequency. If it cannot be avoided, and that sometimes happens for various reasons, then I do ensure that I leave at least a three second break before replying to an over from the other party. I am sure if this technique was followed to the letter by all stations, there would not be the need for prolonged discussions on what seems to me to be common sense usage of a frequency. For some time now, I have been training myself to adopt the idea of a three second break for all contacts on 144 and 432 MHz.

On six metres it may be different. I believe if you are making a 30 second contact on F2 or TEP to some rare station, then it is necessary to have a series of very quick overs for the exchange of the required information to confirm the contact. If you wait three seconds in this case you are likely to have someone else take the contact off you! I am also doubtful if much in the way of breaks are required for strong Es contacts, especially if they are of the signal report and name exchange variety. If you are having a chat with a station, then I believe it would be courteous to allow a break between overs to allow another station to call in. You may become annoyed if that happens too often. If that is the case, you must assume there are a lot of stations around looking for contacts and perhaps you should defer chatting for another occasion.

I am sure there are no hard and fast rules which will suit every situation. The best I can offer for anyone using a calling frequency, particularly in a city, is to consider placing themselves in a distant location and asking themselves "am I likely to be heard by those stations chatting on the frequency?" Finally, for distant stations, never overlook the advantages a CW signal can offer, a carrier beeping away underneath even the strongest signals has a chance of eventually being heard in which case you may be allowed in!

Thanks John, your letters often stir the pot a bit, which is good. At least, this time, it has given me the chance to state my position in this case.

EME CONFERENCE

A letter and phone call recently heralded the safe return of Doug VK3UM and his wife Bev, from the Third International EME Conference held over the weekend of September 9 to 11, 1988, at Thorn in The Netherlands, adjacent to the Belgium border. Thorn has a population of 2800 and the delightful and immaculately restored houses have a history dating back to the Roman Empire.

Doug said it was a magnificent conference, rated by many who should know, as one of the best. More than 200 attended both the Saturday and Sunday sessions — it almost seemed as though all of Europe's amateurs were there! Sixteen countries were represented and there was a great feeling of fellowship and the inter-mix was excellent. The technical content and quality was real state-of-the-art and left one feeling somewhat humble.

Attended by more than 80 OMs and wives, a buffet dinner on the Friday evening started the proceedings. Geert PA3CSG, welcomed the visitors and the conference was opened by the Mayor of Thorn. This was an opportunity for many EME operators to meet the operator "at the other end".

Saturday's activities began with a visit to an old radio museum, where the items on display, in working order, were in considerable contrast to the theme of the conference.

The first lecture was presented by Jan DL9KR, who spoke on the theme of achieving the lowest noise receiving systems. Jan detailed the overall factors that are required to achieve the results necessary for absolute minimum noise systems, including methods of evaluation, ground noise, sun or stellar noise, equipment stability, expected values for system temperatures and their application, antenna gain, feeder loss, preamplifiers, antenna relays, noise figures, filters (RF and AF). Jan left the audience with little doubt why his signal is so loud and his receiving capability a demonstrated. It was a practical summary for all attendees to return home to work on their stations.

This lecture was followed by one entitled "How to achieve low system temperature on 432 EME" by Rainier DJ9BV, who ably demonstrated the problems in noise figure measurement and the traps even the test equipment manufacturers have, until recently, failed to address. His paper has resulted in a means of providing the ability to make true, universal comparative noise measurements throughout the world.

Peter PA3AEF, followed with an appraisal of Minninec 3. Peter outlined the advantages and disadvantages of using the program which at last can be regarded as a guide to antenna design and

a t worst a "mine field" of conflicting conclusions. Inherent "bugs" within the program were demonstrated.

Following Peter's presentation, Gunter DL6WU, spoke on his results and how they compared with the theoretical results obtained by Minninec 3.

The final presentation was given by Doug VK3UM, who detailed the facilities provided by his extensive EME Planner software, which allows system evaluation in accord with practical measurements detailed earlier by DL9KR. Doug further presented the advantages of utilising the software for EME common window scheduling and the evaluation of two-station capability for completing an EME QSO.

A long question period enabled listeners to seek answers to queries from the various speakers and this triggered many lively debates.

Everyone crossed the border to Kinrooi, in Belgium, for the evening dinner which Doug described as an outstanding success!

On the Sunday morning, DJ9BV supervised noise figure measurements on the 432/1296 preamplifiers. Results of these will be known later.

Group discussions on a wide variety of subjects were held concurrently with the NF measurements, with topics including sequencing, identification procedures, reporting sequences, activity weekend choices, etc. Also, during this period, video tapes were shown of the W6LET EME efforts, W3IWI, 4U1UN, and PA3CSG operations, together with slides and photographs of JA stations.

The conference was closed at 1700 by PA3CSG, who was presented with a documented memento from the participants, by N7ART and VK3UM.

Represented at the conference were many stations, who comprised, by definition, those who had had a minimum of one QSO off the moon on frequencies above 432 MHz. From Germany there were 11 call signs, France 10, UK 4, Italy 1, USA 2, Norway 1, Austria 1, Belgium 1, The Netherlands 4, Sweden 6, Poland 1, Canada 1, Yugoslavia 2 and Australia 1.

While the amateurs were discussing EME throughout the weekend, the ladies were occupied with a full program of activities, including much sightseeing.

There is a lot of excellent, state-of-the-art information contained in the various papers presented at the conference. It is beyond the scope of this column to include them here, one can only hope they can be made available by means of some medium, to those who can use the information. EME enthusiasts might consider sending a stamped envelope to Doug VK3UM, seeking details on how the information may be obtained.

Obviously, what has been printed above does not do justice to the material included in the papers, an overview has been given here so readers may be advised of the content, from which they can make their own decisions whether to follow the matter any further. Thank you Doug for sending me the information.

SIX METRE DX STANDINGS

Next month being the February issue will see the updated Six Metre Standings List. The receipt of a revised list from Rob VK3XQ, which is correct in every aspect, reminded me that I wanted to make a comment about the Standings.

Ever since I started the Standings several years ago, I have always prefaced the list with the comment "Credit has not been given for contacts made with stations when 50 MHz was not authorised."

The reason for this was due to my knowledge of some contacts having been made on 50 MHz by Australian stations during Cycle 21 when we were not authorised to make such contacts. To my knowledge, no one claimed a listing for any such contacts.

With Cycle 22 well and truly upon us now, it may be worth me stating that the position has not changed as far as the Standings are concerned. Under the terms of Document DOC 71 from DOTC, as I understand it, the band 50.000 to 50.150 MHz may be used in VK6 without restriction. In VK5 and VK8 power is restricted to 25 watts output at the transmitter. In VK2, 3, 4, and 7, operating is only permitted outside the broadcasting hours or Channel 0.

Therefore, any claims submitted from the eastern States for contacts between say 0000 and 1300 UTC will have to be disallowed unless there is proof of the contact having occurred on 52 MHz. This may seem unfair, but there is little else I can do; I cannot be seen to be condoning operating during hours not provided for in the regulations.

It seems a pity that the restrictions are in such a blanket form in the eastern States. In Europe, where many countries are geographically so close, there are administrating bodies permitting operations on 50 MHz on a non-interference basis and utilising a 10 watts output limit during television hours. Something along similar lines here would satisfy most operators and any problems of interference would be minimal. Most interference in this country is still going to be co-channel interference during periods of enhanced propagation.

OTHER NEWS

The West Australian VHF Group Bulletin for October says that the Perth VHF beacons are nearing readiness for a return to operation. Hopefully, by the time you read this the beacons will be installed in their permanent site at the Channel 7 transmitter site.

Col VK5RO, says there has been considerable six metre activity during October, with the band open to somewhere most days. Despite the excellent days during the early part of the month when eastern States stations were working into W-land, the conditions did not extend as far as VK5.

On 24/10 ZL2KT worked K6FTA and WA6BYA for first contacts to the US for this cycle.

There have also been continuing reports of JAs working long path into Europe. I am not sure whether they did that during Cycle 21 but they seem to be doing it at the moment.

The VK5LP establishment is still under severe restrictions at the moment with the driven element broken on the six metre beam. The VK5 beacon is only S1 instead of its usual S9+ so any hope of hearing signals on the band are nil. South Australia has had one of its windiest periods for many years, with almost every change in the weather producing gale force winds. My neighbour says that he believes we have had the worst winds in 30 years. The wind today (26/10) reached 111 kmh! Little wonder David VK5KK, has been unable to climb the tower to replace the broken element. If this continues I may have to go out portable!

CLOSURE

It will be 1989 by the time you read this. All the Bicentenary 1988 fixtures will be concluded. For most this will mean some rest, for me it means a year with further activities. 1989 represents 150 years since the first settlement of the Torrens Valley of which Forreston, my former home town, is part. I have a commitment to give some help with their celebrations including the completion of my book on the history of Forreston, which I started to research over five years ago. This has taken much of my spare time, but with its completion by July/August 1989, I am looking forward to spending extra time on the bands, particularly six metres, where there is promise of much interesting activity over the next two or three years at least.

Closing with two thoughts for the month: "Some people reach the top of the ladder only to find it is leaning against the wrong wall" and "A woman with true charm is one who can make a youth feel mature, an old man youthful, and a middle-aged man completely sure of himself."

73 From the Voice by the Lake.

ar

Awards

Ken Gott VK3AJU
WIA FEDERAL AWARDS MANAGER
38A Lansdowne Road, Saint Kilda, Vic. 3183

WARC BANDS IN NEW ARRL AWARD

There is a special role for two of the WARC bands in a new award announced by the ARRL to mark its 75th anniversary in 1989.

All QSOs for the ARRL Diamond Jubilee Award must be made within 1989, as defined in UTC, and there are three routes for winning it on HF.

1. By working 75 different DXCC countries on any combination of the 18 and 24 MHz bands, each country to be counted only once, irrespective of which band is used. In other words, all 75 may be worked on 18 MHz or 24 MHz, or a combination of both.

   As far as I am aware, this is the first time that QSOs on WARC bands have counted towards a major international award.
2. By working 75 US novice stations in QSOs involving something more than a "hello-goodbye" exchange. This is to provide meaningful contacts designed to help US novices improve their operating skills and to encourage them to upgrade.

   So far, the ARRL does not seem to have given any guidance about the duration of such QSOs, but I expect it is the spirit of the law, rather than the letter, which matters.
3. By working stations in 75 "sections" of the ARRL and Canadian RRL on any combination of bands/modes.

See table below for a list of the sections and some explanation of them.

The Diamond Jubilee Award may be won in one of the three classes listed above and subsequently endorsed for one or both of the other two.

No QSL cards are required, but applicants must personally certify the accuracy of log extracts submitted on the Diamond Jubilee Award Application form. This is available from the ARRL, 225 Main Street, Newington, CT 06111, USA.

No fee for the application form is mentioned, but my experience is that a green stamp plus self-addressed envelope should fetch it. Otherwise two IRCs.

The award itself costs US$5 or 12 IRCs, with US$1 or two IRCs for any subsequent endorsements.

Applications must be received within one year of the end of the award period; ie by December 31, 1990.

Non-members of the ARRL are eligible and awards in all three sections are open to SWLs.

However, don't look for US amateurs on 18 MHz until sometime in the second half of this year as the band is not yet open to them, but the FCC is expected to release it about mid-year. The IARU band plan will apply; ie CW 18.068-18.100 MHz, RTTY 18.100-18.110 MHz, and phone 18.110-18.168 MHz.

The present 24 MHz band plan is also applicable to all regions; ie CW 24.890-24.920 MHz, then RTTY up to 24.930 MHz, followed by phone up to 24.990 MHz.

The Diamond Jubilee Award can also be won on VHF and I will give details in my next column.

In general, the "sections" used in the ARRL Diamond Jubilee Award correspond to the US States and the Canadian Provinces and in the table below they are listed by their standard postal abbreviations, eg CT is Connecticut, ON is Ontario, etc.

However, it is obvious that some of the more populous States have been subdivided. NNJ and SNJ presumably represent northern and southern New Jersey respectively. It is also my guess that ENY is eastern New York and WNY the western part of the Empire State.

Even so, some puzzles remain and I have written to the ARRL asking for a decoding for publication in AR. In the meantime, good hunting, and maybe you could ask some of our American and Canadian colleagues to explain abbreviations which continue to puzzle you.

CENTRAL COAST AWARD

The Central Coast Amateur Radio Club sponsors an award for contacts on any licenced band in any mode, governed by the following:

1. Overseas operators must contact two Central Coast Stations *or* the club station (VK2AFY or VK2EH).
2. VK operators must contact four Central Coast stations plus the club station (VK2AFY or VK2EH).
3. Central Coast operators must contact 10 Central Coast stations plus the club station (VK2AFY or VK2EH).
4. Shortwave listeners must log two-way contacts in accordance with the conditions 1, 2 or 3 above.

A Central Coast Station is one being operated:
— by a member of the CCARC (even if the member resides outside the boundaries of the Central Coast).
— by a person who resides on the Central Coast who is not a member of the CCARC.
— in a portable capacity on the Central Coast, or
— in a mobile capacity on the Central Coast.

The Central Coast is that area bounded by the Shire of Wyong and the City of Gosford combined, the postcodes are 2250, 2251, and 2254 to 2263 inclusive.

Copy only of log entries, certified to be correct by the claimant and another person to be forwarded to the address of the club, PO Box 238, Gosford, Vic. 2250.

EUROPEAN 1992 COMMUNITY (E-1992-C) AWARD

Issued by the European Community, this new unique and very attractive award should emphasise the objectives of the Community.

The "E-1992-C" Award can be obtained by all licensed radio amateurs and shortwave listeners from January 1, 1989 onwards.

Requirements:

There are three ways to log 12 x 12 different stations from the 12 member countries on the HF bands either in CW, SSB or mixed.
Portugal: CT, CU; Germany FRG: DL; Spain: EA, EA6; Ireland: EI; France: F, TK; Italy: I, IS; Denmark: OZ, OY; Belgium: ON; Luxembourg: LX; Greece: SV, SV5, SV9, SY; Netherlands: PA; United Kingdom: G, GD, GI, GJ, GM, GU, GW, ZB2.

Outside the UBA Contests

Log 144 different stations from the EC members countries.
At least six different stations from each of "The Twelve".
At the most 20 stations per country to complete the required 144.

During the UBA Contests

Log 144 different stations from the EC member countries.
At least two different stations from each of "The Twelve".
At the most 24 stations per country to complete the required 144.
The application must arrive with your contest entry. (See this month's Contest Column for rules of the UBA Contest).

Combined Results

A missing LX or SV station in the contest may be replaced outside the contest by two other stations from that country.
All other contacts should be logged in the UBA contest and you must have sent your entry.
Combined results from up to four consecutive UBA contests to achieve the requirements will be accepted.

The application must consist of:

A written request signed by the applicant and certified by two licensed amateurs.

List with date, time, call sign, report, band and mode of 144 contacts.

The award fee of seven IRCs, US$4 or equivalent value in other currency.

Name, call sign and full address of the applicant and his witnesses.

The award claim should be sent to: UBA HF Award Manager, Van Campenhout Mat ON5KL, Hospicestraat, 175, 9080 Moerbeke-Waas, Belgium.

ar

ARRL/CRRL SECTIONS

1	2	3	4	5	6	7	8	9	0	VE
CT	ENY	DE	AL	AR	EB	AZ	MI	IL	CO	MAR
EMA	NLI	EPA	GA	LA	LAX	ID	OH	IN	IA	PQ
ME	NNJ	MDC	KY	MS	ORG	MT	WV	WI	KS	ON
NH	SNJ	WPA	NC	NM	SB	NV			MN	MB
RI	WNY	NFL	NTX	SCV	OR			MO	SK	
VT			PR	OK	SDG	UT			NE	AB
WMA			SC	STX	SF	WA			ND	BC
			SFL	WTX	SJV	WY			SD	YU /NWT
			TN		SV	AK				
			VA		PAC					
			VI							

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7277

CONTEST CALENDAR

January 1989

1 — 7 Ross Hull Memorial VHF/UHF Contest continues
7 — 8 First ARRL RTTY Roundup Contest (Rules this issue)
28 — 29 WIA Trial VHF/UHF Field Day Contest (Rules December issue)
28 — 29 REF French Contest (Rules this issue)
27 — 29 CQ Magazine 1989 160 meter DX Contest (Rules this issue) CW
28 — 29 UBA Belgian DX Contest (Rules this issue) CW

FEBRUARY 1989

11 — 12 QCWA CW Party
11 — 12 YLRL YL/OM SSB Contest
18 — 19 ARRL DX CW Contest
24 — 26 CQ WW 160 meter SSB Contest
25 — 26 YLRL YL/OM CW Contest
25 — 26 UBA Belgian DX SSB Contest (Rules this issue)

MARCH 1989

4 — 5 ARRL DX SSB Contest
11 — 12 RSGB Commonwealth Contest
18 — 19 NZART Field Day Contest
18 — 19 WIA John Moyle Memorial Field Day Contest
25 — 26 CQ WW WPX SSB Contest

CONTEST RESULTS

VK4TT was the top scoring VK station in the 1988 REF French Contest CW section.

VK3IO was the leading station on the Oceania CW section of the 1988 CQ World-wide 160 meter contest for Australia, with VK2BQQ the runner up. In the SSB section, VK3IO being the only entry from VK was the top scorer with 1440 points.

VK4TT was the leading VK station in the 1987 LZ DX contest with 2646 points.

VK4TT was also the leading VK station in the Belgian UBA CW Contest for 1988 with 144 points.

VK4TT and VK5BS both are to receive certificates for being the VK leaders in the USSR GC contest for 1987, VK4TT being the Oceania winner for SOSB section and VK5BS for the SOMB section.

Congratulations must go to you all, keep up the good work.

As we have rather a lot of contest rules to publish this month, and you will all be getting your portable stations together for the forthcoming summer contests, which will include the trial VHF/UHF Field Day for you to enjoy, I will wish you all a Happy New Year and good contesting.

CQ WORLD—WIDE 160 METER DX CONTEST

CW — January 27-29.
SSB — February 24-26
Starts — 2200 UTC Friday
Ends — 1600 UTC Sunday

Conditions and activity on the 160 metre band are at their maximum. We can expect over 100 active countries on both Phone and CW. Here is your chance to run up your State and Country totals in a very short time. The "DX Window" has not been seriously observed for several years. Since many stations could not operate there anyway, the only frequency restrictions are those of your own country. We still encourage Pacific DX to transmit 1.907 to 1.912 MHz and specify a listening frequency. W/VE transmission there is counterproductive. Any station can always specify a listening frequency if he/she so desires.

CLASSES — Single and multi-operator. Use of a spotting net makes you multi-operator.

EXCHANGE — RS/T and QTH. State for the US, areas for Canada, prefix for DX, country abbreviation for those with unusual prefixes.

Stations operating in a State different from that indicated by the call are required to sign portable.

SCORING — Contacts with stations in own country, two points. Contacts with stations on other countries in same continent, five points. Contacts with stations in other continents, 10 points.

MULTIPLIER — Each US State (48), Canadian area (13) and DX country. Maritime Mobiles separated by at least 100 miles. Canadian areas: VO1, VO2, NB, NS, PE1, VE2, VE3, VE4, VE5, VE6, VE7, NWT, Yukon, KH6 and KL7 are considered countries, but not also States. USA and Canada may not be counted as country multipliers. Maritime Mobile points determined by location. ARRL DXCC and WAE country lists and WAC boundaries are the standards.

FINAL SCORE: Total QSO points times the sum of all multipliers (States + VE areas + DX Countries + Maritime Mobiles).

PENALTIES: Three additional contacts may be deleted for each unacknowledged duplicate or unverifiable contact removed from the log. A second multiplier may be removed for each one lost by the above action.

DISQUALIFICATION: You may be disqualified for violation of your country amateur radio regulations, unsportsmanlike conduct or claiming excessive duplicate or false multiplier contacts. If the corrected score without penalties shrinks more than three percent from that claimed, disqualification will be considered. Disqualified stations or operators may be barred from competing in future CQ contests for up to three years.

AWARDS — Certificates to the top scorers in each class, each State, Canadian area, and DX country. Also, the following plaques.

Single Operator

	CW	SSB
World	by K5AAD	by K5AAD
USA	by K4TEA	by K4JRB
Europe	by K4UEE	by N4NX
Africa	by K4SB	by WB4ZNH
S America	by K4TKM/6	
Asia	by WD4RCO	

Multi-operator

World	by N4RJ	by Southeastern DX Club

The above plaques may be won by the same station every other year. Winner of a world plaque will not also receive a sub-area one. It will go to the runner-up.

Sample log and summary sheets may be obtained from CQ by sending a large SAE with sufficient funds to cover your request. You can make tour own, 40 contacts per page, columns for UTC, exchanges, multiplier and its sequential number only the first time it is worked.

Include a summary sheet with your entry showing the scoring and other essential information and a signed declaration that all rules have been observed. Mailing deadline for CW entries is February 28 and March 31 for the SSB section.

Send logs to 160 Meter Contest Director, Donald McClenon N4IN, 3075 Florida Avenue, Melbourne, FL 32904 USA. They may also be sent to CQ, 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801. Please indicate CW or SSB on the envelope.

UBA CONTEST 1989

The Union of Belgian Amateurs invite all amateurs world-wide to participate in this contest.

The UBA has the honour to announce that this contest will be challenged under the Patronage of Mr Ripa di Meana, Member of the Commission, responsible for Communication, Information and Culture.

The European Community Trophy will be presented to the highest scoring EC member station from both the CW and SSB Class B competition.

NAME AND AIM: To contact as many Belgian and other amateurs as possible and to provide a way to achieve the WABP and the EC awards in the "UBA Contest".

PERIODS: Last full weekend of January and February each year. CW on January 28 1300 UTC to January 28 1300 UTC (24 hours). SSB February 25 1300 UTC to February 26 1300 UTC (24 hours).

CLASSES:
(a) Single operator single band.
(b) Single operator multi band.
(c) Multi operator single transmitter all bands.
(d) QRP 10 watt input as Class B.
(e) SWL as Class B.

BANDS: 10, 15, 20, 40 and 80 metres. Frequencies according to the IARU Region 1 Band Plan.

CW — 3.500-3.560; 7.000-7.035; 14.000-14.060; 21.000-21.080; 28.000-28.100 MHz.

SSB — 3.600-3.650; 3.700-3.800; 7.040-7.100; 14.125-14.300; 21.200-21.400; 28.500-28.800 MHz.

CONTEST CALL: CW "TEST UBA"; SSB "CQ UBA".

EXCHANGE: RS/T plus serial number starting from 001. Note that Belgian stations give their province abbreviation (eg 59001/AN).

SCORING: QSO with ON, DA1 and DA2 counts 10 points. QSO with other European Community member stations as listed below counts three points. QSO with any other station counts one point.

MULTIPLIERS: All Belgian provinces: AN, BT, HT, LB, LG, LU, NR, OV, WV. Each of the prefixes ON4, ON5, ON6, ON7, ON8, ON9, DA1, DA2. All other countries from the European Community: CT, CU, DL, EA, EA6, EI, F, G, GD, GI, GJ, GM, GU, GW, I, IS, LX, OZ, OY, PA, SV, SV5, SV9, SY, TK, ZB2. A total maximum of 43 per band.

FINAL SCORE: Total QSO points times the total number of multiplier points.

LOGS: Showing date, time (UTC), station worked, exchange with respective serial number, multipliers and points. Use a different sheet for each band. Each entry must have a summary sheet showing all the scoring information, class of entry, mode, name, call sign/s, full address and a signed declaration. The IARU R1 standard format sheets are recommended. Computer print-outs are accepted provided they have the same format as hand written logs. Computer logs on disc can only be accepted when the format is MS DOS/ASCII.

SWL: Log the call sign of the station heard, complete report sent by this station, call sign for the station worked, your report to the station heard. Points will be considered for stations in the "heard stations" column only.

DECLARATION: "I declare that all contest rules and all the rules and regulations for amateur radio operations in my country have been observed and adhered to. I accept the decisions of the contest committee."

ADDRESS FOR LOG: UBA HF Contest Committee, Galicia Jan ON6JS, Oude Gendarmeriestraat, 62, B-3100 Heist Op Den Berg, Belgium.

DEADLINE: All entries must be postmarked not later than 30 days after the contest.

AWARDS: The new "UBA Contest Award" will be sent to the highest scoring station in each class from each country. Other participants receive a certificate provided they contact at least 40 stations.

The EC Trophies go to the EC winners of Class B from each event.

A special engraved plaque is donated by ON6JG to the overall winner in Class B of the SSB contest.

PENALTIES AND DISQUALIFICATION:

Penalties for:

— incomplete or incorrect exchange, nil points.

— deduction of three times QSO value for any unmarked duplicate contact.

Disqualification applies for:

— incomplete or late entry (the latter will be treated as a check log).

— violation of the rules.

— unsportsmanlike behaviour.

— excessive number of unmarked duplicates () 2 percent).

FIRST ARRL RTTY ROUNDUP

Racket — Baudot — AMTOR — ASCII

Many digital communication choices await participants in this year's *New* RTTY Roundup. This is the *first* annual all-digital contest sponsored by the ARRL.

The object of the RTTY Roundup is to work as many digital stations as you can world-wide on any of the allowed digital modes within the allotted time period. QSO point totals are multiplied by the total number of different States plus VE provinces plus DXCC countries worked. So, it pays to try different bands to work into different areas. Remember, multipliers count only once (*not* once per band), but you can rework the same station on a different band for additional QSO points. You may operate more than one digital mode during the contest, but QSOs and multipliers may only be counted once regardless of mode.

One of the most exciting twists of this contest is packet radio. Packet stations are reminded that contacts for contest credit may *not* be made using digipeaters.

In addition to the competitive aspects of a digital-only contest, it is also a great chance to work new States, provinces and countries for awards.

Even if you have never operated an SSB or CW contest before, jump in — it is fun! You can read all about contesting and digital operation in *The ARRL Operating Manual* or *ARRL Handbook*, available from your Division or direct from ARRL Headquarters.

Getting Ready

Okay, you want to give the ARRL RTTY Roundup a try. What next?

1. For starters, carefully read the rules published here.

2. Get the proper paperwork. ARRL offers a package of forms to help you organise your contest entry. You wouldn't dream of doing your tax return on a sheet of notebook paper, would you? Here is what you will need:

* *Log sheets* for keeping track of your contest contacts. These special log sheets have spaces for all of the information that you need to record for each QSO.

* *Dupe sheets* to help you organise, in alphanumeric order, the call signs of stations contacted. If you fill out the dupe sheet as you operate, you can tell at a glance whether or not you have contacted a station before. You will need one per band.

* *Summary Sheet* to help you figure out your final score. The summary sheet is very important because it also helps us get your score listed correctly in *QST*.

Recommended HF Digital Operating Frequencies (MHz)

North and South America	*Europe/Africa*
3.590 RTTY DX	*3.580-3.620*
3.605-3.645	
7.040 RTTY DX	*7.035-7.045*
7.080-7.100	
14.070-14.099.5	*14.080-14.100*
21.070-21.100	*21.080-21.120*
28.070-28.150	*28.050-28.150*

Recommended Novice Digital Operating Frequencies (MHz)

10 metres: 28.100-28.150* *suggested simplex packet radio frequencies: 28.102.3 28.104.3*

* Authorised power output 200 watts maximum for Novices Techs *only* on the 10 metre Novice sub-band.

Canadian Multipliers

Prefix	Province	Prefix	Province
VO1/VO2	NFLD /LAB	VE4	MB
VE1	NB	VE5	SK
VE1	NS	VE6	AB
VE1	PEI	VE7	BC
VE2	PQ	VE8	NWT
VE3	ON	VY1	YUKON

You can obtain a contest package by sending a business size self-addressed envelope plus sufficient postage to ARRL RTTY Roundup Forms, 225 Main Street, Newington, CT. 06111. Each package includes one summary sheet, one dupe sheet and three log sheets. Each log sheet has room for 200 contacts. Feel free to make photocopies as necessary.

Rules:

OBJECT: Contact and exchange QSO information with as many stations as possible on digital modes. Any station may work any other station.

CONTEST PERIOD: First full weekend of January. Begins 1800 UTC Saturday, January 7, and ends 2400 UTC SUnday, January 8, 1989. Operate no more than 24 hours. Two rest periods (for a combined total of six hours) must be taken in two single blocks of time, clearly marked in the log.

MODES: Amateurs may use the following modes: Baudot RTTY, ASCII, AMTOR and Packet (attended operation only).

BANDS: All amateur bands, 3.5 to 30 MHz (excluding 10, 18 and 24 MHz).

ENTRY CATEGORIES:

(a) Single Operator, multi band — One person performs all operating and logging functions. Use of spotting nets (operating arrangements involving assistance through DX-alerting nets, etc) is not permitted. Single-operator stations are allowed only one transmitted signal at any given time.

1. less than 150 watts output.
2. 150 watts output or more.

(b) Multi Operator, single transmitter only — More than one person operates, checks for duplicates, keeps the log, etc. Once the station has begun operation on a given band, it must remain on that band for at least 10 minutes; listening time counts as operating time. Multi-operator stations are allowed only one transmitted signal at any given time.

EXCHANGE:

For United States: Signal report and State.

For Canada: Signal report and Province.

For DX: Signal report and serial number, starting at 001.

Note: Both stations must receive and acknowledge the complete exchange for the contact to count.

SCORING:

(a) QSO Points: Count one point for each completed QSO (anyone can work any one). A station may be worked once **per band** for QSO credit (but not for additional multipliers).

(b) Multiplier: Count only once (not once per band), each US State (except KH6 and KL7), each VE province (plus VE8 and VY1) and each DXCC country. KH6 and KL7 count only as separate DXCC countries. The US or Canada do not count as DXCC countries.

MISCELLANEOUS: Cross band and cross mode contacts are not permitted. Packet radio contacts made through digipeaters or gateways are not permitted.

REPORTING: Contest forms (log sheets, summary sheet, dupe sheet) are available from ARRL Headquarters. Official forms are recommended. Any entry making more than 200 total QSOs must submit duplicate check sheets (an alphabetical listing of stations worked). Incomplete or late entries will be classified as check logs and are not eligible for competition or awards. Logs should indicate dates, QSO times, on and off times, call signs of stations worked, complete exchange sent and received for each contact, and band. Postmark your entry within 30 days after the contest ends (by February 8, 1989). Send entries to: ARRL Contest Branch, 225 Main Street, Newington, CT. 06111.

AWARDS: Distinctive certificates will be awarded to: Top high-power and low-power Single-operator and Multi-operator scorers in each ARRL/CRRL Section; top high-power and low-power Single-operator and Multi-operator scorers in each DXCC country (other than W/VE); each Novice and Technician entrant; each entrant making at least 50 QSOs.

CONDITIONS OF ENTRY: Each entrant agrees to be bound by the provisions as well as the intent of this announcement, the regulations of his/her licensing authority and the decisions of the ARRL Awards Committee.

FRENCH CONTEST 1989

TRAFFIC: Only with stations from France, FFA (French Army in Germany), DOM-TOM (Departments and Territories overseas). Prefixes beginning with F, TV, HW, TK. . .

PERIODS:

CW begins the last Saturday of January, Saturday January 28, from 0600 UTC to Sunday January 29, 1989, 1800 UTC.

PHONE begins the last Saturday of February, Saturday February 25, from 0600 UTC to Sunday February 26, 1989, 1800 UTC.

BANDS: 3.5, 7, 14, 21, 28 MHz, with respect to the IARU segments.

REPORTS: RS/T and serial number. French stations give also their department number.

POINTS: For each QSO, one point in the same continent, or three points with another continent.

MULTIPLIER: Per band, one point for each different department (Corsica-TK — has two departments: 2A and 2B), FFA (DA1 and DA2), DOM-TOM.

The station F6REF/00 counts as one special point.

FINAL SCORE: Sum of all QSO points multiplied by the sum of multiplier points from each band.

CATEGORIES: Mono-operator, Multi-operators, SWLs.

LOGS: Must be received before March 15 for CW and April 15 for Phone.

ADDRESS: Reseau des Emetteurs Francais REF Contest, C/- M Pacchiana Christian F6ENV, 7 Chemin des exoles, Quartier St-Jean, 13110 Port-de-Bouc, France.

1988 NATIONAL SPRINTS CORRECTION

Unfortunately my friend (?) Murphy became involved in the results as published in the October 1988 issue of AR. One of the excellent CW performers was relegated to a tail-end of the Phone Section.

Rex Shilton VK4CAG, with a score of 20 points was an equal winner in VK4 (with VK4YB and VK4TT) CW Section.

Rex is an avid and very active brass pounder in the Sunshine Coast Radio Club — listing his result in the Phone scores was akin to handing a key man a power microphone!

As soon as the error was discovered, a Certificate was dispatched to Rex to mark his excellent performance. The Adelaide Hills Amateur Radio Society looks forward to his entry in the 1989 event. The fault is entirely my responsibility and I apologise for the error in the copy submitted to AR.

—Contributed by John Hampel VK5SJ, National Sprints Contest Manager

ar

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

Before closing the book on our Bicentennial Year, perhaps we will take a quick look back.

1988 was a very important year for YLs, with so many YL awards being offered, and keen sought after. The Dutch were first in the field with their "YL-Year 1988" Award, followed by the Japanese, Brazilian and Finnish YL organisations, and our own Mavis Stafford Bicentenary Trophy. These special awards were in addition to the ongoing YL awards and contests running concurrently.

ALARA activated many of the special Bicentennial call signs during the year, including VI88 — WIA, NSW, VIC, SA, QLD and WA. Thousands of contacts were made, and QSLing efficiently handled.

Bicentennial efforts included the Mavis Stafford Bicentennial Trophy, Bicentennial Stickers on ALARA awards and award upgrades, and Bicentennial Certificates for those qualifying in the ALARA Contest. In addition, the call signs VI88WIA and VI88QLD were in use for our Birthday Activity Day, and VI88WIA during the ALARA Contest.

Barbeques, luncheons, and get-togethers were held in several States, and were well attended.

On September 4, ALARA conducted the WIA VK3 Divisional Broadcast, and was handled very professionally by the ladies concerned.

A presentation of books was made to Walford School, in Adelaide, in appreciation of the use of the school facilities during the ALARA-Meet in September 1987.

Meg VK5AOV, and associates conducted a very successful "Get-to-Know-Amateur-Radio" with the girls at Walford School during August.

Christine VK6ZLZ, became WIA VK6 Divisional President; Mavis VK3KS, won two gold cups and a plaque with the highest DX score, phone and CW, in the DX-YL to NA-YL Contest. (The NA winners also happened to be ALARA members). Jenny VK5ANW (our hard-working Secretary) and OM Mike celebrated their Silver Wedding Anniversary. Marjorie VK3HQ and Bobbie VK6MH, achieved the milestone of 50 years in amateur radio, and each received a memento of the occasion from ALARA. Sadly Bobbie became a Silent Key early in the year. We were also saddened by the loss of Eleanor VK4BEM and long-time member, Daphne Hugo (VK6).

Now, with a new page to write on, a new year ahead, and improving propagation, let us hope we can continue the activities and renew the friendships made in 1988.

Chris VK2VCC.

JOAN AND THE JAPANESE CAPTAIN

Joan Beevers VK3BJB, well-known for her activities as a controller of the Japanese Maritime OKERA Net, was recently invited, together with her husband and son, to visit the Japanese ship the *Aki Maru* as a guest of Captain Yorio Tsubota JI2GAZ/MM. The following account of the visit appeared in a Mildura newspaper:

"The captain of a Japanese bulk carrier was given a sample of Sunraysia wine, dried fruit and other produce last week, and was amazed.

"Not at the produce, but that someone he have never met would do a 2400 kilometre round trip to deliver it in person.

"That's exactly what Mildura-based amateur radio enthusiast, Joan Beevers did last week, and it's not the first time.

Mrs Beevers, fluent in Japanese, has been speaking to the skippers of giant ocean-going tankers and other carriers for about 18 years.

"She has received scores of invitations to visit overseas ports in a variety of countries.

"They're a bit far for her to travel, but when one of her regular radio contacts comes closer to home, Mrs Beevers loves to try and meet them in person.

"She has already met contacts in Portland and Melbourne, but last week she made her longest trip — she and her husband Ray, and son Brad, 13, went to meet Captain Yorio Tsubota, skipper of the 88 000 tonne bulk carrier *Aki Maru*.

""We often talk over the radio on the mobile maritime channels," Mrs Beevers said yesterday.

""You get to know the skippers of a lot of the ships over the years, but it's not often I get a chance to meet them in person."

"She said Captain Tsubota was amazed that she would travel the 1200 kilometres to be his guest for two days.

""We were looked after like royalty" she said. "We had the stateroom, the run of the ship, and Captain Tsubota cooked us a meal in his quarters."

"Mrs Beevers presented the skipper and his crew of 27 with a good sample of local produce, some of which they had never tasted before.

""They loved the dried fruit." she said.

"Mrs Beevers contacted Captain Tsubota by radio on her return to Mildura, and this time he extended another invitation — for her to be his guest in Japan.

"Mrs Beevers has been in amateur radio for the last 18 years, and was speaking to so many skippers and crew of Japanese ships and trawlers that she decided to learn the language four years ago.

"She now speaks it fluently, and is in daily radio contact with many of her maritime contacts."

Joan's radio activities keep her very busy — she has been guest speaker at three Rotary Club Meetings recently, and at other meetings, besides being visited by many radio friends. She has also participated in an on-air interview. To quote from Joan's letter "Who said that staying at home and being a housewife was boring?"

THE MAVIS STAFFORD BICENTENNIAL TROPHY

Hopefully, there will be plenty of logs heading towards Mavis, and it will be very interesting to see who has won this trophy — and who has won the consolation prize offered by Margaret VK4AOE.

Don't forget that the closing date for logs to be received is January 31, so if you have not already done so send your log to: The Award Custodian, Mavis Stafford VK3KS, 16 Byron Street, Box Hill South, Vic. 3128. *You have to be in it to win it!*

MID-WINTER CONTEST — January 14/15, 1989

The Mid-winter Contest is held under the auspices of a YL Committee (BYLC, BYLARA, Elettra Marconi and DYLC).

Rules are as follows:

CW — Saturday January 14, from 0700 to 1900 UTC.

SSB — Saturday January 15, from 0700 to 1900 UTC.

All HF bands, no cross-band. YLs call CQ Contest and work YLs and OMs.

Log entry with call RS/T, number, YLs start with 2001, country plus time and date, YL or OM.

Points: QSO with YL five points, with OM three points, one station per band may be worked.

Multiplier: every DXCC country counts as multiplier (not per band). Total score for all bands, points time multiplier. SWLs as above.

Log showing call of station submitted to: BYLC, PO Box 262, 3770 AG Barneveld, Netherlands. Must be postmarked before February 20, 1989.

YL-YEAR 1988 AWARD

(Full details were published in December 1987 *Amateur Radio*).

Following requests to extend the period of the award, it has been extended by two months and a final day. You can work January and February 1989 with eight or 11 YLs per month. February 1989 is the *Final* Day. Every contact with a YL station on this day counts for two points (Joker). In your application you can use a total six Joker stations, from February 29, 1988 or February 28, 1989, or mixed. These Jokers must be all different stations. Six Joker stations are enough to complete a missing month. No other changes to the award conditions.

(The certificate for this award is quite attractive).

AWARD UPDATE

No	Date	Recipient	Sticker	Bicenten Stick
	1988			
140	Jul 13	Sue Ludeman KA6SOC		1
141	Aug 3	Ken Watson VK2CKW		1
22	Jul 23	Pearl Neilson ZL2QY	6	1
40	Sept 16	Elizabeth Anderson VE7YL	16	1

NEW MEMBER

Welcome to Chris VK2VCC. We are glad you have decided to join us.

A very happy and prosperous New Year to all.

73/33, Joy VK2EBX.

ar

Walli DJ6US.

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

The new regulations, the brochures being produced by DOTC to replace the *Amateur Operator's Handbook,* have been circulated in draft form for the Institute's comments, and the comments have been returned to the Department.

The set will consist of:

- DOC 70 — Information for Prospective Amateur Operators, which contains the information about examinations, exemptions, reciprocal licensing, club operation and the examination syllabuses;
- DOC 71 — Licence Conditions and Regulations Applicable to the Amateur Service, which covers operation of stations, frequency allocations, classes of emission, power limits and repeater/translator conditions; and
- DOC 72 — Amateur Service - Operating Procedures, covering calling and reply procedures, distress communications, the Q-code and emission designations.

Photocopies of DOC 71 are available from State Offices of DOTC. It is expected that the others will also be available fairly soon.

Discussion with DOTC early in November produced an assurance that the new brochures and the information therein, will not become examinable until well after they are all freely available. We will be given some months notice before the examinations are based on their contents. This means that the February examination will be still based on the 1978 edition of the *Amateur Operator's Handbook*.

From my reading of the drafts, there is not a lot of change from the regulations as we have become used to them. Of course account has been taken of the changes to operating requirements since the last publication. The intent has been to make them more relevant to the amateur service, some of the distress procedures which relate to the maritime service have been deleted. The emphasis on the Q-code has been reduced.

The section which will cause candidates most trouble is the Emission Designations. At first reading it appears much more complex than A3J or F5. It is still based on the same characteristics as we have been using, but also has a bandwidth component. An explanation of the system used has previously been published in this journal (see June 1986, page 9).

Most instructors have tended to leave the Regulations out of the course, expecting the students to be able to rote learn the required sections. The new publications will make most of this easier, as in many cases the language has been simplified, and some logic appears. But I would like to recommend that instructors give some class time to the section covering emission designations. Not only will it help the candidates to pass the Regulations examination, but explanation of the official language will help them to understand more about modulation and types of transmissions, and so help the theory sections as well.

Because of the extension of novice privileges to include some of the two metre band, it has become necessary to include a small section on FM theory in the 'Transmitters' and 'Receivers' sections of the novice syllabus. This should not cause much problem as we are assured questions will require only a basic level of understanding, and I expect to be able to view the questions before they are released.

My best wishes for 1989 to all readers. It will be another year of big changes on the administration side of our hobby. By the end of the year, the development machinery should be fully in place, and we will have more control than ever over who is eligible to join our ranks.

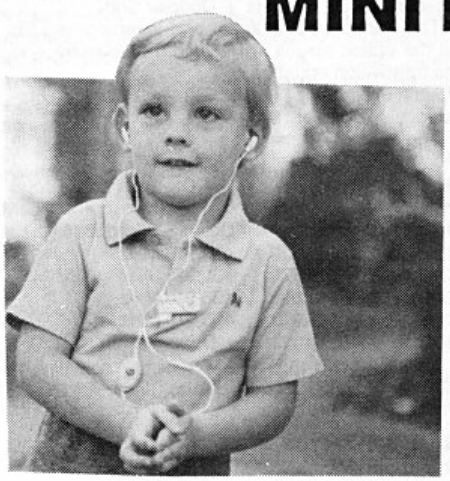
The opportunities to encourage, instruct and enlist new recruits put some responsibility on all members to contribute to the new system in one way or another. It would be a shame to lose potential new members because no one could be bothered to arrange for an examination, or to pass on information as needed.

There are very few of us who have entered the hobby without some assistance from an established amateur. Now will be the opportunity to repay those old debts by helping a newcomer to obtain a licence.

73, Brenda VK3KT

ar

MINI RADIO GIVES AN EAR FULL



What was claimed to be the smallest ever commercial FM receiver was launched at the Seoul Olympic Games.

Those attending the Olympics opening and closing ceremonies were given one of the receivers free. This was a gesture assisted by the manufacturers Samsung, whose factory is located in South Korea. Samsung are well-known in Australia as their quality products are beginning to appear in the television receiver and VDU stores.

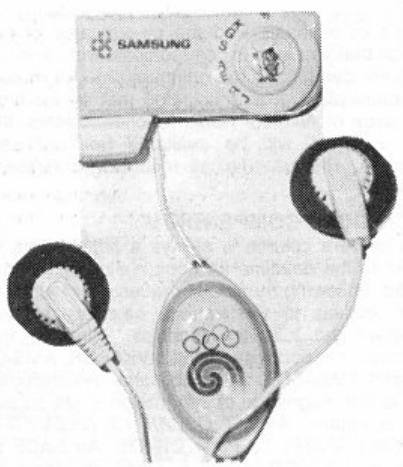
Each radio was presented in a plastic container similar in size to a standard cassette holder and was powered by two supplied 'button' batteries and was capable of receiving the multilingual transmissions from transmitters located at the Olympic village. The languages used were Korean (K), German (G), Arabic (A), English (E), Spanish (S), Japanese (J), French (F) and Russian (R). Each language being coded on the dial as per the brackets.

It is not known whether they will be commercially marketed to the public but going on their popularity at the time it seems that they would be quite a viable proposition.

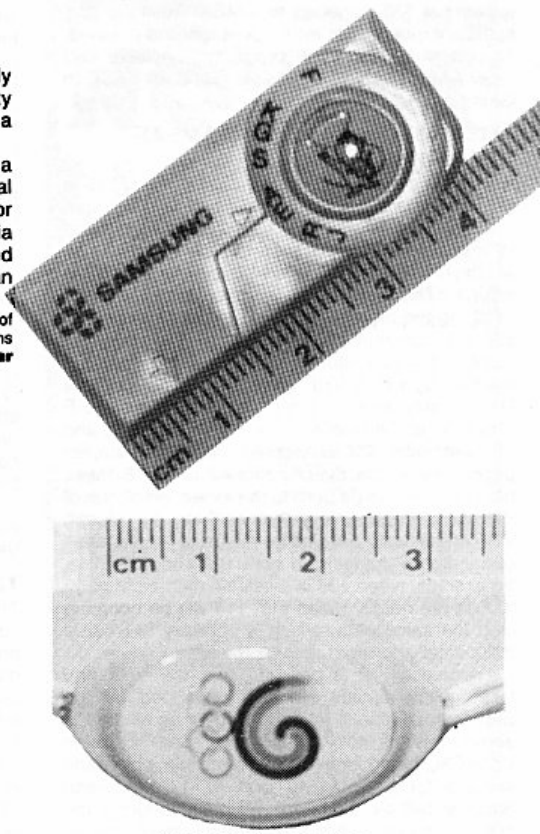
Each unit comprises of two single ear phones, a battery holder and the radio. The radio on removal of the metal back reveals a tuning capacitor mounted onto a circuit board which is fed power via a three pin phased plug which is also cabled connected to the earpieces and doubling as an antenna.

—Contributed by Jim Linton VK3PC. Photographs courtesy of Betken Productions

ar



The complete radio.



The battery housing.

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC.
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz

AMSAT SW PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia. This information is also included in some WIA Divisional Broadcasts.

AMSAT-AUSTRALIA NEWSLETTER AND SOFTWARE
The fine monthly publication *AMSAT-Australia Newsletter* published on behalf of AMSAT-Australia by Graham VK5AGR, now has 280 plus subscribers. Should you also wish to subscribe, then send a cheque for $20 made payable to AMSAT-Australia and post to:
AMSAT-Australia, C/- PO Box 2141, GPO, Adelaide, SA. 5001.

The Newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellite activities.

Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. The only requirements to make use of this service is to send Graham a diskette nominating your requirements, a nominal $10 donation to AMSAT-Australia and sufficient moneys for return postage and packing. To obtain details of the programs available and other AMSAT-Australia services, send an SASE to Graham.

AMSAT-OSCAR 13 VERSUS AMSAT-OSCAR 10
It is obvious my "tutorial" on AMSAT-OSCAR 13 in the November issue has raised world-wide interest.

Some additional points that have been brought to my attention by Graham VK5AGR, are also worthwhile to readily share with the readers of this column. The first is a phenomena that has been aware to the more ardent VHF enthusiasts turned satellite communicators. During the summer months, the ionisation of the E layer provides the medium by which VHF enthusiasts work copious DX primarily on six metres, using the Sporadic E phenomena. The medium, by which two metre and 70 centimetre DX is worked over the summer period cannot be directly related to the E layer, however it is due (in part) to the ionisation of one of the tropospheric layers that encircle our planet. VHF enthusiasts will also be aware of the vagaries of conditions applying to both 144 and 432 MHz, for example when 432 is available over a set path, it does not readily mean that 144 will be booming over the same path, which is contrary to what is theoretically considered to be the case.

Theoretically it is believed that the VHF and UHF uplink signals are not influenced by the Earth's tropospheric layers, however as alluded to above this is not always the case. Graham VK5AGR, being one of the erstwhile command stations for both AO-10 and AO-13 has been documented on numerous occasions during the summer months in-ordinate attention of the 45 UHF uplink. Graham believes this is directly related to the partial ionisation of a tropospheric layer. (Partial: implying frequency dependency). How many satellite communicators on OSCARs 6, 7 and 8 remember the staccato QSB that was only evident on the downlink signals during the summer months. The theory being 10 metre signals trapped (reflecting) within ionised E layers and eventually spilling out through "holes" in the ionised layers. Therefore, should you experience the odd occasion where you find that your uplink power has to be increased to ensure your downlink is comparable but *not greater* than the general beacon on 158.812 MHz give some thought to the above.

However, the most important issue that I wish to bring to readers attention is the significance of *squint angle*. Just to refresh memories, *squint angle* is the term coined by Jim Miller G3RUH, to define the angle subtended by the centre line of the satellites receiving and transmitting antennas and the communicator (ie you and I). Taking into account that the satellite antennas have defined beamwidths, there is an optimum period for the most effective communications.

Similarly, the beamwidths and effective tracking of the communicators station antennas also come into the equation for effective communication. Just recently Graham VK5AGR, in one of his rare idle moments, was reflecting on comments made by an American station who had compared notes with Graham, on his comparisons of AO-10 versus AO-13 as observed from the USA. Although the operator considered AO-13 was superior, he was puzzled as to why his best DX had been transposed from the west of his QTH to the east. Intrigued by the sincerity of the comments, Graham set about using PLAN-10 (G3RUH's Tracking Program) to ascertain what the *mutual* squint angles would be under the circumstances. In hindsight, the results were predictable, however prior to analysing the problem, Graham openly admitted he and many others like him had only ever stopped to consider their own environment with respect to the spacecraft. As I mentioned in my last tutorial, the rules have changed with AO-13 and comparisons to AO-10 should be tempered.

Nonetheless, Graham's exercise was not wasted as he saw the tremendous potential for a *Mutual Squint* scenario for G3RUH's program. An approach to Jim has already ensured that a Beta copy of a new version of Plan-10, incorporating this feature, will be in the mail for Graham's evaluation within weeks. Fundamentally, you enter your QTH's co-ordinates and the co-ordinates of the station that you wish to communicate with, and the program determines the optimum time for *mutual* communication. It is anticipated that by the time this issue of *Amateur Radio* reaches readers, the new software will be available from AMSAT-Australia. Please refer all inquiries to Graham VK5AGR.

TECHNICAL COMPENDIUM
This month's column is always a difficult one to cover as the deadline for copy is literally months ahead. Following numerous requests for technical data relating to the various satellites I have compiled the following technics. Primarily, the information is courtesy Graham VK5AGR, AMSAT-UK and AMSAT-DL. One publication not included due to the magnitude of information (eight pages) is one entitled *AMSAT OSCAR 13 TELEMETRY BLOCK FORMAT* by Peter DB2OS. An SASE to Graham VK5AGR, with a small donation to AMSAT-Australia (to cover photocopying, etc) requesting this document will yield a dearth of information who wish to decode the PSK Telemetry from AO-13.
de Colin VK5HI

AMSAT OSCAR-10
Due to radiation damage to the Onboard Computer memory, the Mode L transponder and beacons are no longer active. However, the Mode B transponder and beacons continue to operate when there is sufficient solar illumination on the solar panels.

Mode B Transponder

Uplink Passband	Downlink Passband
435.027 — 435.179 MHz	145.977 — 145.825 MHz

The transponder is linear and inverting; ie LSB on the uplink results in USB on the downlink and the translation equation is:
Downlink Frequency = 581.004 - Uplink Frequency ± Doppler Shift

The General Beacon is on 145.810 MHz and the Engineering Beacon is on 145.987 MHz. Due to the OBC memory failure, the General Beacon only transmits a steady CW carrier. The Engineering Beacon is now rarely ever heard.

FUJI OSCAR-12
Fuji OSCAR-12 has two transponders with two associated beacons.

Mode JA Transponder — Analogue (ie voice)

Uplink Passband	Downlink Passband
145.800 — 146.000 MHz	435.900 — 435.800 MHz

Beacon — 435.795 MHz ± Doppler Shift

The transponder is linear and inverting; ie LSB on the uplink results in USB on the downlink and the translation equation is:
Uplink Frequency = 581.800 — Downlink Frequency ± Doppler Shift

The beacon transmits telemetry information in Morse code.

Mode JD Transponder — Digital (1200 Baud PSK)

Uplink Frequency	Downlink Frequency
Channel 1 — 145.850	435.910 MHz
Channel 2 — 145.870	435.910 MHz
Channel 3 — 145.890	435.910 MHz
Channel 4 — 145.910	435.910 MHz

Beacon — 435.910 MHz ± Doppler Shift

Uplink is two metres FM and the downlink is 1200 Baud PSK on SSB and uses AX.25 V2 Packet Radio protocol.

RADIO SPUTNIK — 10
Transponders

MODE	UPLINK BAND	DOWNLINK BAND
K	21.160 — 21.200	29.360 — 29.400
T	21.160 — 21.200	145.860 — 145.900
A	145.860 — 145.900	29.360 — 29.400
KT	21.160 — 21.200	29.360 — 29.400 and 145.860 — 145.900
KA	21.160 — 21.200 and 145.860 — 145.900	29.360 — 29.400

Beacons: 29.357, 29.403*, 145.857 and 145.903 MHz.
Robot Up: 21.120, 145.820 MHz.

RADIO SPUTNIK — 11
Transponders

MODE	UPLINK BAND	DOWNLINK BAND
K	21.210 — 21.250	29.410 — 29.450

T	21.210 — 21.250	145.910 — 145.950
A	145.910 — 145.950	29.410 — 29.450
KT	21.210 — 21.250	29.410 — 29.450 and 145.910 — 145.950
KA	21.210 — 21.250 and 145.910 — 145.950	29.410 — 29.450

Beacons: 29.407, 29.453*, 145.907 and 145.953 MHz.
Robot Up: 21.130, 145.830 MHz.

The transponders on RS-10/11 are linear and non-inverting transponders; ie USB on the uplink produces USB on the downlink. Also note that a frequency on the low end of the uplink passband corresponds to a frequency on the low end of the downlink passband. Beacons transmit telemetry information in Morse code.
* denotes confirmed Robot downlink frequency.

RADIO SPUTNIK — 5 AND RADIO SPUTNIK — 7

Mode A Transponders
Uplink Passband 5 — 145.910-145.950 and Uplink Passband 7 — 145.960-146.000
Downlink Passband 5 — 29.410-29.450 and Downlink Passband 7 — 29.460-29.500

Beacons and/or Robot Transponder Downlinks

29.331	29.341
29.452	29.501

Robot Transponder Uplinks

145.826	145.835

RS-5 and RS-7 transponders are also linear and non-inverting — see above.

DESIGN AND LAUNCH OF RS-12 and RS-13

RS-12 and RS-13 are brothers of RS-10/11. RS-12 and RS-13 were built at the Tsiolkovskiy Museum for the History of Cosmonautics in Kaluga city, an industrial centre 180 kilometres south-west of Moscow. The chief architects of the project were Alexsandr Papkov and Victor Samkov. RS-12/13 — one monounit mounted in primary payload COSMOS, carrier navigation system for sea ships (as well as RS-10/11). Launch time of RS-12 and RS-13 is expected in 1989.

Obit Configuration
Polar circular orbit with average height 1000 kilometres (621 miles), inclination 83 degrees and period 105 minutes.

Transponder
RS-12

Mode "A"	**Uplink**	**145.910 - 145.950**
	Downlink	**29.410 - 29.450**
	Beacon	**29.4081 (or 29.4543)**
Mode "B"	**Uplink**	**21.210 - 21.250**
	Downlink	**29.410 - 29.450**
	Beacon	**29.4081 (or 29.4543)**
Mode "T"	**Uplink**	**21.210 - 21.250**
	Downlink	**145.910 - 145.950**
	145.9125 (or 145.9587)	
Mode "KA"	**Uplinks**	**21.210 - 21.250**
		145.910 - 145.950
	Downlink	**29.410 — 29.450**
	Beacon	**29.4081 (or 29.4543)**
Mode "KT"	**Uplink**	**21.210 - 21.250**
	Downlinks	**29.410 - 29.450**
		145.910 - 145.950
	Beacons	**29.4081 (or 29.4543)**
		145.9125 (or 145.9587)

RS-13

Mode "A"	**Uplink**	**145.960 - 146.000**
	Downlink	**29.460 - 29.500**
	Beacon	**29.4582 (or 29.5043)**
Mode "B"	**Uplink**	**21.260 - 21.300**
	Downlink	**29.460 - 29.500**
	Beacon	**29.4582 (or 29.5043)**
Mode "T"	**Uplink**	**21.260 - 21.300**
	Downlink	**145.960 - 146.000**
		145.8622 (or 145.9083)
Mode "KA"	**Uplinks**	**21.260 - 21.300**
		145.960 - 146.000
	Downlink	**29.460 - 29.500**
	Beacon	**29.4582 (or 29.5043)**
Mode "KT"	**Uplink**	**21.260 - 21.300**
	Downlinks	**29.460 - 29.500**
		145.960 - 146.000
	Beacons	**29.4582 (or 29.5043)**
		145.8622 (or 145.9083)

AUTOANSWER "ROBOT"
RS-12
Modes: A, K, T, KA, KT
Uplink: 21.1291 and/or 145.8308 MHz
Downlink: 29.4543 and/or 145.9587 MHz
RS-13
Modes: A, K, T, KA, KT
Uplink: 21.1385 and/or 145.8403 MHz
Downlink: 29.5043 and/or 145.9083 MHz

Technical Data
DC Power:
All Systems Off — RS-12 4.6 watts RS-13 3.5 watts
All Systems On (max output) — RS-12 35 watts RS-13 25 watts

RS Output Power:
Beacon and "Robot" (low/high) — RS-12 0.45/1.2 watts RS-13 0.45/1.2 watts
Transponder Tx (29 or 145) — RS-12 about 3 watts RS-13 about 8 watts

AMSAT OSCAR-13

Mass:

Launch Weight	140 kg
Mass in Orbit	90 kg

Dimensions:

Height with Antennas	1.35 m
Width with Antennas	2.00 m

Antennas on the Satellite
70 cm directional = 10 dBic (right hand circular)
2 m directional = 6 dBic (right hand circular)
20 cm + 2 m omni = -2 dBi
23 cm helix = 11 dBic (right hand circular)
13 cm helix = 12 dBic (right hand circular)

Solar Generator:
Initial capacity — 40 watts
After three years in orbit — 25 watts

Life Expectancy:
six years

Launch:
Rocket = Ariane IV; V-22
Launch Site = CSG, Kourou
Date = June 1988

Orbit:
(after launch)
Apogee 35 800 kilometres
Perigee 200 kilometres
Inclination 10 degrees
(after orbit correction)
Apogee 35 800 kilometres
Perigee 1 500 kilometres
Inclination 57 degrees
Orbital Period 11 hours
Stabilisation Spin Stabilised

U Transponder:
Input 435.420 MHz to 435.570 MHz
Output 145.825 MHz to 145.975 MHz
General Beacon 145.812 MHz
Engineering Beacon 145.985 MHz
Transponder Power 50 watts PEP
Necessary transmit power at a ground station = 10 watts to a 12 dBic antenna (right hand circular).

L Transponder:
Input 1 1269 MHz to 1269.330 MHz
Output 1 435.715 MHz to 436.005 MHz
Input 2 144.425 MHz to 144.475 MHz
Output 2 435.651 MHz to 435.940 MHz
General Beacon 435.651 MHz
RUDAK Input 1269.710 MHz
RUDAK Output 435.677 MHz
Transponder Power 50 watts PEP
RUDAK Power 6 watts

Necessary transmit power at a ground station = three watts to a 24 dBic antenna (right hand circular).

S Transponder:
Input 435.601 MHz to 435.637 MHz
Output 2400.711 MHz to 2400.747 MHz
Beacon 2400.325 MHz
Transponder Power one watt

Necessary transmit power at a ground station = three watts to a 24 dBic antenna (right hand circular).

ar

DEADLINE FOR MARCH IS JANUARY 20, 1989

SATELLITE ACTIVITY FOR AUGUST/SEPTEMBER 1988

1. LAUNCHES

The following launching announcements have been received:

INT'L NO 1988	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
074A	OSCAR 23	Aug 25	USA	107.4	1176	1032	90.0
074B	OSCAR 31	Aug 25	USA	107.4	1178	1032	90.0
075A	Soyuz TM-6	Aug 29	USSR	See		note	
076A	Cosmos 1966	Aug 30	USSR	11h48m	39299	617	62.6
077A	USA 31	Sep 02	USA				
078A	USA 32	Sep 05	USA				
079A	Cosmos 1967	Sep 06	USSR	90.3	409	206	72.9
080A	Fengyun 1	Sep 06	China	102.8	904	881	99.1
081A	Gstar 3	Sep 08	USA	983.1	36161	16587	1.5
081B	SBS 5	Sep 08	USA	1423.4	35786	35289	0.1
082A	Cosmos 1968	Sep 09	USSR	88.7	262	192	82.3
083A	Progress 38	Sep 09	USSR	88.8	267	193	51.6
084A	Cosmos 1969	Sep 15	USSR	89.7	373	178	67.0
085A	Cosmos 1970	Sep 16	USSR	11h14m	19102	19102	64.8
085B	Cosmos 1971	Sep 16	USSR	11h14m	19102	19102	64.8
085C	Cosmos 1972	Sep 16	USSR	11h14m	19102	19102	64.8
086A	CS-3B	Sep 16	Japan		37200	200	
087A	Horizon 1	Sep 19	Israel	98.8	1150	250	142.9
088A	Cosmos 1973	Sep 22	USSR	90.2	395	206	72.9
089A	NOAA H	Sep 24	USA				

2. RETURNS

During the period 90 objects decayed including the following satellites:

1988-048A	Soyuz TM-5	Sep 07
1988-072A	Cosmos 1964	Sep 09
1988-073A	Cosmos 1965	Sep 22
1988-079A	Cosmos 1967	Sep 15
1988-082A	Cosmos 1968	Sep 23

3. NOTES

1988-075A Soyuz TM-6:

This satellite carried Commander Vladimir Lyakhov, Physician Valeriy Polyakov and Afghan Research Cosmonaut Abdul Ahad Mohmand to the orbital station MIR. Docking was made on August 31, and SOYUZ TM-5 undocked on September 05 with Vladimir Lyakhov and Abdul Ahad Mohmand on board. The descent module landed at 0050 UTC , September 07, 160 kilometres south-east of the city of Dzhezkazgan.

1988-081A Gstar 3 & 1988-081B SBS 5:

These satellites were launched for the USA at the European Space Agency facility at Kourou, French Guiana.

—Contributed by Bob Arnold VK3ZBB

ar

MORSEWORD 23

Audrey Ryan

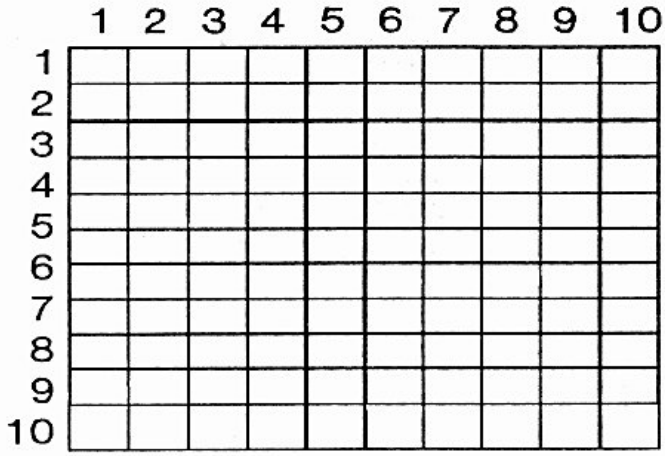
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1 Incise
2 Dye
3 Scene
4 Pews
5 Young Elizabeth
6 Trot
7 Wander
8 Rips
9 Set of rooms
10 Fish

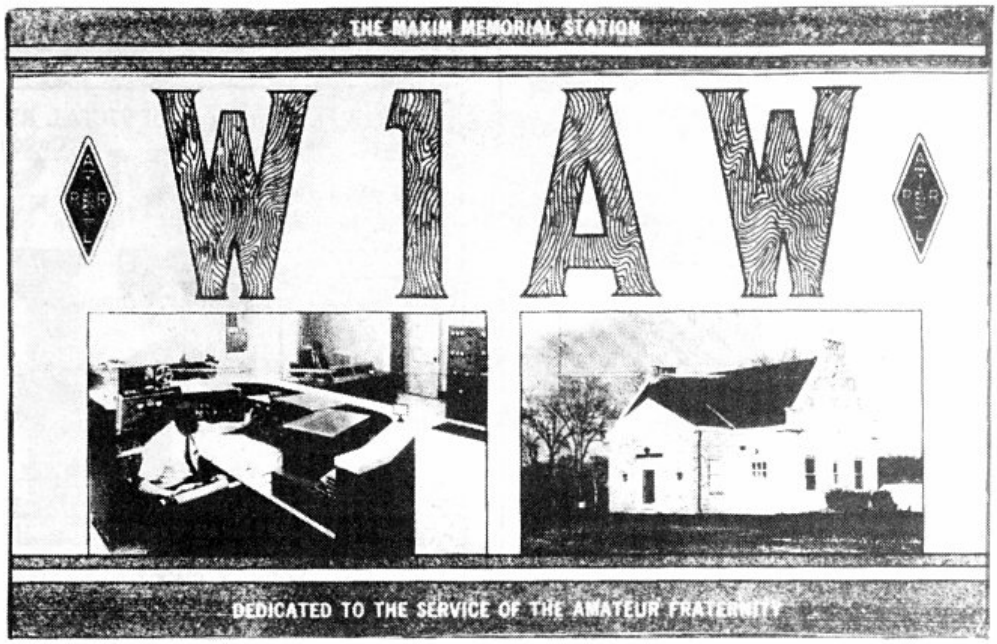
DOWN

1 Spoken
2 Fades
3 Bottom
4 Servant boy
5 Faces the bowler
6 Bulb
7 Huge
8 Appears likely
9 Set of Stipend
10 Adapts



Solution page 60. . .

QSLs from the WIA Collection



W1AW

This is a QSL from the radio station of the American Radio Relay League (ARRL) Headquarters situated at Newington, Connecticut. It also was the call sign of one of the outstanding pioneers of amateur radio administration.

In these days of advanced technology and general affluence which enables one to choose and purchase an infinite range of radio equipment "straight off the shelf", it is easy to forget not only the pioneers of amateur radio, technology but those of amateur radio administration. The QSL shown here represents part of the history of how the organisation of amateur radio (as we know it today) really got started. It is true that amateur experimenters were active in the early 1900s. Both Australian and American experimenters had their own call signs even back in the early 1900s although general licencing did not eventuate until later in the decade. However, there was no organisation of amateur activities except through a few local radio clubs. The story of amateur radio administration, at least on a national basis, really starts with the ARRL, which although possibly not the oldest national administrative body in the world (our own Wireless Institute of Australia has a claim to that achievement), did more than any other body on an international level to establish and guard the interests of all amateurs throughout the world.

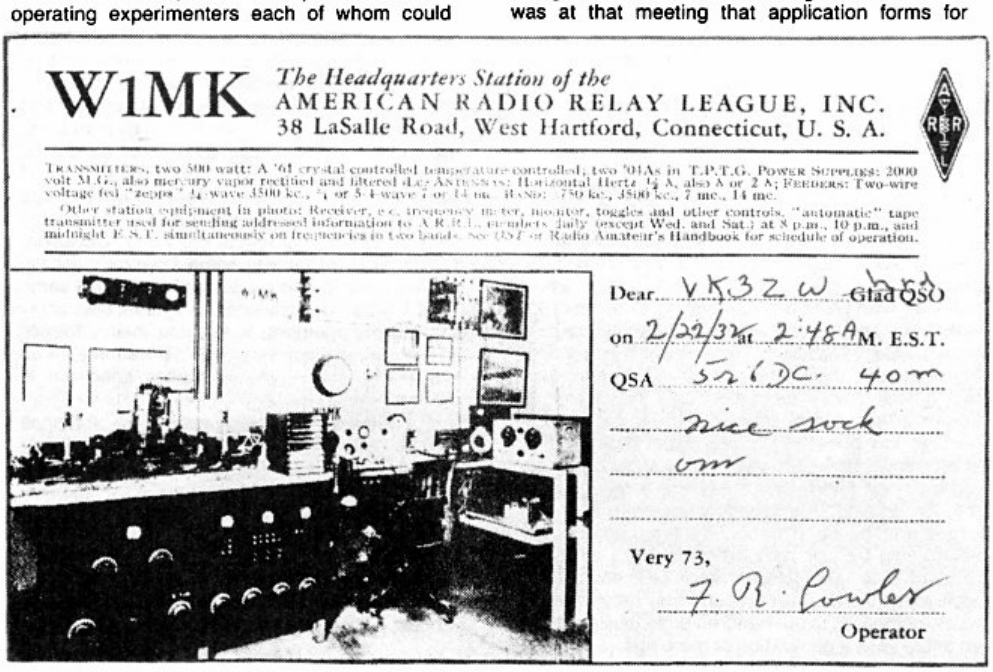
The name of the founder and first President of the ARRL was Percy Hiram Maxim, a name much revered throughout the world of amateur radio. Although almost every amateur will know of the ARRL (and its periodical, *QST*), few will realise the significance of that word "relay" in its title. The whole development of amateur radio, in fact, could be said to centre around that one word.

The use of spark transmission and long waves (one always spoke of wavelengths rather than frequencies in those days), severely limited the distance over which transmissions could take place. The answer to the problem of overcoming distance therefore, was to set up a series of co-operating experimenters each of whom could help relay a message. This needed good organisation as well as the spirit of being willing to help one another — a spirit which was to grow throughout the whole field of amateur radio serving to bond it into a powerful but friendly body.

It was Hiram Maxim, assisted by Clarence D Tuska, who put this necessary organisation into effect through a league of relay stations. Of course, written communication between members of the relay team was also needed and that is the story of the periodical *QST*.

It was on April 6, 1914, at a meeting of the Radio Club of Hartford, Connecticut, that a committee was set up to investigate the possibility of forming what was to become known as the ARRL. The date of the club meeting of May 18, 1914, is generally recognised as the birth of that organisation since it was at that meeting that application forms for membership to the newly-formed league were distributed. About three months later, a system of relay routes was formulated so that messages could be passed from one part of the country to the next. These trunk line routes covered the whole of the United States. On February 1, 1915, the ARRL became independent from the Hartford Club and became incorporated as a non-profit organisation, continuing to operate however from Hartford. By the end of 1916, more than 150 cities had been linked through relay by the main trunk lines, with branch lines completing the national coverage. A large number of relays were necessary since the spark transmitter was not the most efficient of devices. After all, a half-inch spark could send a signal over about five miles, a kilowatt unit, a few hundred.

All transmissions used telegraphy and there was, at that time, virtually no use of amplification (De-Forest's audion, although capable of amplification, was mainly used by the few experimenters who had one, as a more efficient device to crystal or electrolytic detectors). A milestone was reached on January 14, 1917, when a message was transmitted (through relay) across America from one coast to the other, and on February 6, a transcontinental transmission and message reply was received. (It took one hour 24 minutes for this relay from East Coast to West Coast and return!). Thus began an organisation that was to grow in strength and to voice the rights of amateurs, a fact that was to be soon put to the test in the 1920s (and in latter years), when the curtailment of amateur radio frequencies was threatened by both governments and the interests of commercial radio.



W1MK

This card is from the Headquarters station of the ARRL, in West Hartford, Connecticut, before the station was relocated at Newington. The main transmitters were each of 500 watts, and there was an auxiliary transmitter of 250 watts.

The first W1MK station (operating initially as 1 MK) was at the Headquarters Offices of the ARRL and was established in 1924. After a shift in location (still in the State of Connecticut) the station was destroyed by floods in March 1936. From that time it was determined to establish a

new and better station to replace W1MK and to make this a fitting memorial to the founder of the ARRL, Hiram Maxim, who had died on February 17, of the same year.

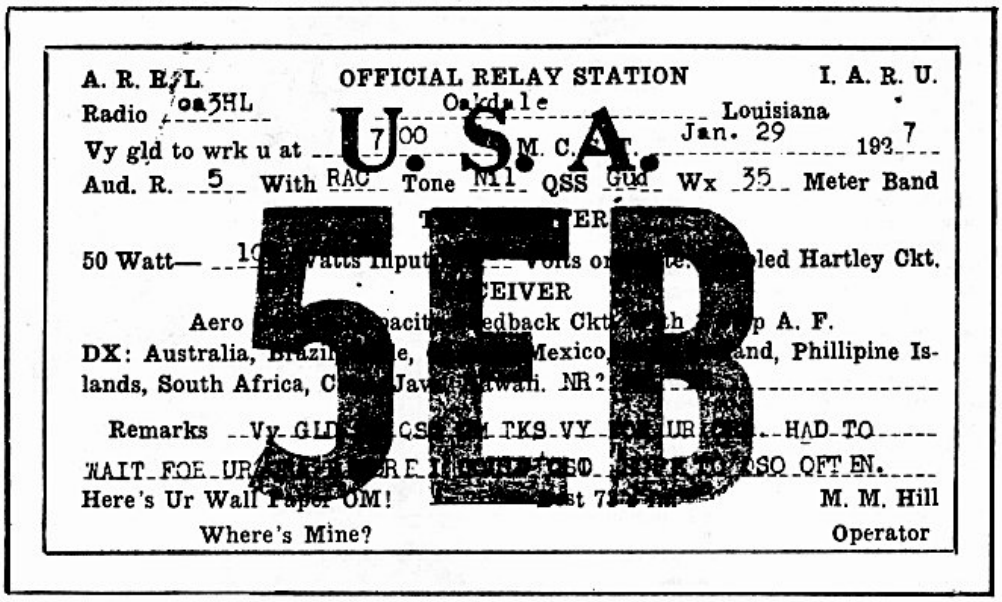
The new station was located at Newington on a seven and a half acre site, and on the anniversary of his death the station was dedicated to this pioneer. It became known as the *Maxim Memorial Station* and bore the call sign, W1AW. As pointed out, this was Maxim's old call. The Federal Communications Commission (FCC), with the special approval of Maxim's heirs, changed the ARRL Headquarters call sign from W1MK to W1AW, in order to perpetuate his call and to serve as a lasting memorial to him. It was believed to be the first instance of the FCC authorising such a change in call sign. The new call was first used to commence a memorial relay on February 17, 1937.

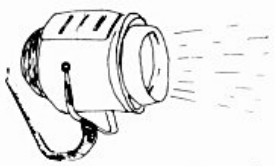
5EB

Dated January 29, 1927, the interesting feature of this QSL card from America (and several others like it of the 1920s) is the title *Official Relay Station* at the top of the card.

Wishing to unite various radio clubs through the proposed league, ARRL, Hiram Maxim sent a letter to the President of the Radio Club of Hartford, as early as March 25, 1914, in which he said; "The object of securing the membership of the various Clubs, would be to have those Clubs advise us as to what stations in their locality are the best ones for us to appoint as Official Relay Stations." Thus the whole network of relay stations was established throughout America comprised of those amateurs known for both their skill and reliability. Little wonder that M M Hill was proud enough to identify his station as a member station of this remarkable relay system.

ar





Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Well, another year has commenced and finally we can put the Bicentennial Year behind us. As I am writing this in early November, I cannot comment on any recent happenings on the shortwave scene. Yet, the improvement in high frequency propagation has continued and the experts have been tipping that we could reach the peak of this Sunspot Cycle as early as the end of this year and the beginning of 1990, which would be indicated by what we are at present observing.

At the end of October there were substantial changes to the BBC World Service to emphasise an increased emphasis on news and current affairs. For example, at 2300 UTC, there is an hour-long program titled "Newshour", similar to the National Public Radio program we used to hear via the AFRTS in our local evenings. The best channels I have found are 15.140 and 9.570 MHz, both from the BBC Far Eastern Relay in Singapore. As well, there is a communications magazine on the "Beeb" at 0730 on Thursdays. Try 7.150 or 12.095 MHz for this.

The half-hour "Newsdesk" is now heard four times a day, with an extra bulletin at midnight UTC as well as the regular 0400, 0600 and 1800 releases. "Twenty Four Hours" basically remains unaltered with the 2009 release being deleted. A new weekly news review program called "Worldbrief" will also be heard on Sundays at 2009, but I don't have the other releases at present.

And while we are on the BBC, the Seychelles Relay comes in well here on 15.420 and 17.885 MHz at 0430, with programs in the BBC African Service. The other shortwave broadcaster from the Seychelles is FEBA, a gospel broadcaster and I hear an English release at 0545 on 17.820 MHz, on Fridays. The latter station does verify, whilst the BBC issues a response reply card to all the many thousands of reports they receive.

This leads into the subject of QSL cards. More international broadcasters are dispensing with issuing QSLs as being too time-consuming. They are interested in comments about the program content, for this is the primary reason why they do engage in broadcasting. Most broadcasters have monitoring panels to draw on to get technical reports and are interested especially in audience feedback on the programming side. Naturally this has upset some of the DX "purists". The issue came to a head at the 1988 EDXC Conference, when the DX community largely boycotted the Conference, because of the emphasis on international broadcasters and comments on program content. As a result, the 1989 Conference is in doubt at this stage, for Radio Australia International, who were originally going to sponsor it, withdrew citing the expected poor attendances.

To be blunt, DXers are a decreasing breed and the allure that the hobby had 30 or 40 years ago has well and truly dissipated. In those times, it certainly was some achievement to pullout an obscure low powered drifting signal down in the lower range of frequencies, constantly drowned out by static and then identify the language and the country, etc. The broadcasters were only too eager and pleased to confirm their broadcasts were going far and wide. These days, I am sure most of them are not interested or motivated to reply to the thousands of reports they receive each week, compared to the hundred or so they got over an entire year, a generation or more ago.

The Australian Radio DX Club has this interesting definition:

> "DXing means the systematic reception of distant and/or overseas radio transmissions without regard to message content, where transmission is by electromagnetic means".

Bob Padula has written a four page article in the October 1988 "AXDN" entitled "DXing — What it really Means". He is scathing of the trend towards program listening among some members of that club, reminding the readers of what the objectives of the ARDXC are, the monitoring of stations and collection of verification cards (QSLs) by members.

Now, do I regard myself as a DXer or just an ordinary shortwave listener? To be honest, I tend towards the latter. I just don't seem to have the time to systematically monitor the bands and dispatch reams of reports throughout the world. Occasionally I do send reports to some stations , usually with comments on the programming. It is the same with my amateur activities, as I have seemingly restricted my operating to working mainly friends and not getting involved in the "DX rat-race". I do enjoy listening over the HF utility spectrum in articular.

I would like to eventually improve the antennas at this QTH. Alas, I fear that putting up a beam would meet quite a few obstacles. As well, I voluntarily restrict my transmitting to outside normal television broadcasting hours, although I haven't received any complaints.

Where this year will lead me, I do not know at this stage.

Well, that is all for this month. Until next time, the very best of listening and 73 — Robin VK7RH.

ar

Radio Amateur Old Timers' Club

Kevin Duff VK3CV
10 Stanley Grove, Canterbury, Vic. 3126

The Radio Old Timers' Club (Victoria) held its Annual Luncheon and get-together on Wednesday, September 21, 1988, at the usual venue, The City and Overseas Club, in Windsor. There were 60 members present and among the guests were Jim Linton, Bill Roper and Chris Long. The President, Bill Gronow, welcomed members and then the first half-hour was devoted to "eye-ball" QSOs and much gossip.

By arrangement with the Melbourne Science Museum, Allan Doble VK3AMD, displayed the original receiver, designed and built by Max Howden A3BQ, which was used for the first two-way amateur contacts with the USA in 1924. (This unit was shown on the cover of *Amateur Radio* in May 1985 during the Institute's 75th Anniversary). A fine photograph of A3BQ operating this receiver and his transmitter during 1924 was shown and a large collection of Maxwell Howden papers were also arranged for members to peruse.

After lunch, members were privileged to enjoy a slide show and talk by historian Chris Long, who is a contract worked for the Melbourne Museum and the National Film and Sound Archives. This covered much ground and Chris explained the role of museums in the collection of old and valuable historical equipment and documents.

He described the early equipment of the late "Mac" McConnell VK3RV. The transmitter and receiver were built in 1934 and were still going 54 years later. The microphone was a "Reece" with carbon granules.

There were many slides showing the collection of early radio speakers and receivers, etc, by the former president of the Historical Radio Society, Ray Kelly.

The A3BQ receiver.

Chris then spoke about one of the very early "tape" recorders built by the Marconi Company in 1934, which used steel tape two millimetres wide and went through the heads at one and a half metres per second! The ABC brought one of these monsters. The spools were almost a metre in diameter and were best loaded into the machine by two people. There were two half-horsepower motors involved. The steel tape ran for about 30 minutes and the program was then changed to disc recording while the new tape was loaded. This

Max Howden 3BQ, of Box Hill, Victoria, the first Australian Amateur to effect two-way communication with America.

The photograph was taken in late-1924 and appeared in *Wireless World (UK)*. The caption on the original photograph states:

"Transmitting with an input of half a kilowatt on 86 metres, the aerial current is 0.9 ampere. An aerial 80 feet high, situated on top of a hill is employed. On the left of the illustration is the receiver, and on the right the transmitter. A feature of the station is its simplicity. No elaborate apparatus is employed."

MAX HOWDEN (3 BQ), OF BOX HILL, VICTORIA, THE FIRST AUSTRALIAN AMATEUR TO EFFECT TWO-WAY COMMUNICATION WITH AMERICA.

The A3BQ display at the RAOTC Luncheon.

machine could be a hazard to the unwary because sometimes the tape would break and flip around at one and a half metres per second. This machine was used at the Royal Melbourne Show a few years ago but they had difficulty with the snapping of the tape because the tapes were, after all, 50 years old!

Chris also spoke about the "lifting" of audio from wax cylinders, another one of his jobs. An Edison dictating machine was used for this and it was set into a 90 pound concrete block (about 40 kilograms) to get rid of rumble, hard going! It could be that many of these cylinder transfers, from the turn of the century, will be available on tapes.

Chris suggested if members had any items of historical value or interest and would like them to be preserved, the Museum would be a very suitable place for their permanent deposit.

President Bill Gronow thanked Chris for his interesting and informative display and said that it was amazing just how these ancient pieces of equipment recall many memories to us all.

And so concluded another very successful Luncheon of the Radio Amateurs Old Timers' Club of Australia.

ar

How's DX?

CHANGE OF PREFIX

As of December 23, 1988, at 0001 UTC, the prefix structure for all Omani amateur radio station was revised as per provisions 2119 and 2120 when read with No 2101.1 of Radio Regulations.

Oman stations are now using the prefix A4 plus a digit, ie 0 to 9.

The following prefixes are being used by the Royal Omani Amateur Radio Society:

A41AA — A41ZZ	Local Omani Amateur Radio Stations
A42AA — A42ZZ	Reserved
A43AA — A43ZZ	Special Event Stations
A45AA — A45ZZ	Expatriates and Visiting Stations
A47AA — A47ZZ	Club Stations

—Contributed by Salim Abdulla Al Kitani A41XJV, QSL Manager, Royal Omani Amateur Radio Society

October was a relatively busy month for the people living at this QTH. We spent the school holidays in sunny Brisbane doing the same thing that millions of other Australians did — visited Expo.

We all should congratulate Queensland for putting the fine exhibition together.

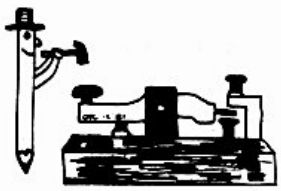
Then, it was onto JOTA where this operator had only a few days to finalise last minute details before going off and setting up at the local Scout Hall to participate in the event. Again, for those who gave their time and expertise, and to AUSSAT for the use of its satellite, we must express our thanks. I know that from my end the boys and girls had a good time.

HEARD AND WORKED ON 20 IN WOODBINE

7/10: K2US.
8/10: HB0/DK1DN (QSL DK1DN), DJ3HJ, CE2AK.
9/10: CT1BOP.
14/10: AD3V.
17/10: ZL2AXI, K7OWJ/BV2 (QSL C/- Heathkit Co, Benton Harbour, Michigan, 49022).
22/10: NE8Z/OA4 (QSL K8LJG), UZ0FWM.
29/10: VE6OU/3, KS9K, KH6FKG, LU5F, AZ4M, TH0X (QSL F6GMB), K3TUP, KX4S, JA6YCU, CE5BYU, JA7YFB, CE4TA, N4ZC, LU4FM, ND3A, W3LPL, RA0JJ, YB0BAQ, JA0ZRY, VU2QQ, VE1ZJ, 3D2DVV (QSL OH2BA), 3D2XX (QSL WB6GEJ).
30/10: FO5IW, LU4FM, CE0ZIJ, NE9O, CE6OS, K2TR, W2GD, W8BI, JA3YBF.

—Contributed by Bob Demkiw VK2ENU

ar



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright. Vic. 3741

ELECTRONIC KEYER AND PADDLE TECHNIQUE

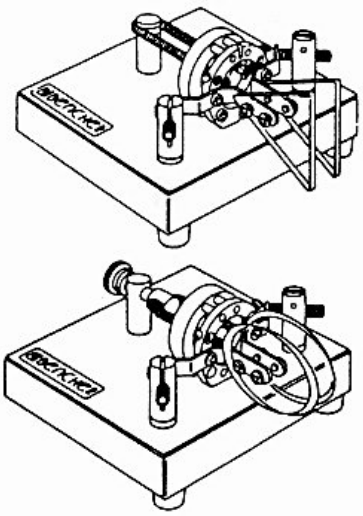
Over the last few months I have been getting an increasing number of inquiries on keyers and a few intrepid home-brewers have even asked me about a kit for the Gilcher paddle! I will not be ordering any more Curtis chips (8044) but you can easily get them direct, and maybe there will be an outlet in Australia soon.

Most Morsiacs at some time or other put aside their hand pump and try a paddle and keyer combination. Many enthusiasts have a stable of keyers and a number of paddles and one of those combinations ends up as the favourite. This can cost quite a bit these days, so it pays to have a feel of another amateur's equipment if you get a chance.

The unofficial standards for right handed operation are dots on the thumb, dashes the finger/s, with shielded twin lead from the paddles to a quarter inch stereo plug, with the dot paddle connected to the tip. The dash paddle to the other shielded wire and the earth to the braid (to shield against RF). Most transceivers with in-built keyers use this system of wiring so you can try your paddles in many rigs.

Whether you are using a kit or a professional keyer will govern how much experimenting you do, but it pays to open up the keyer and install a polarity switch on the input. You can do this on the paddle if you like but most keyers have panel space to spare. Now you can try sending with your left hand. With the dots on the left thumb, etc, this is not as hard as you might think, and if you let your hand do the work you will find that the mistakes come only when you think about what you are doing. It will take a little practice to get up to speed, especially with a few of the letters. My trouble comes with p, x and z, but you might have different ideas. Anyway, this will leave your right hand free to handle the pen or the tuning dial, or whatever. I wish I had learned left handed from the start, so if you can do so, start with your non-writing hand if at all possible, even though it is easy enough to retrain later.

There are two types of paddles used today, and I am not going to refer to mechanical bugs, which, in my view, should be in museums. (But that is another story).



Bencher Keyer Paddles. They come on Iambic or single lever paddles with black, chrome or gold base.

The most common paddle is the iambic or 'twin lever' paddle, called iambic because you can squeeze both paddles together to get the iambic rhythm of didahdidahdidah. Non-iambic paddles have only one lever and are sometimes called slap paddles because you have to slap them from side to side to generate each element. As a rule, people who learn to use slap paddles hardly ever bother to re-learn iambic sending when they get a twin lever paddle. They should consider that they could be cutting their movements by about 57 percent by learning the proper techniques of the particular iambic letters which are r, k, f, l, c, q and y. Sometimes call the 'Iambic Seven'.

Modern transceivers usually have a keyer as part of their design, or at least available as an option costing about the same as a kit of parts would cost without the box. So if you are paying for all the bells and whistles on the new unit, it will pay you to build or buy a good paddle and learn to use it properly. There is nothing to stop you from banging a few nails into a block of wood and bending a piece of shim brass to suit and trying iambic paddling. Or you can spend a couple of hundred dollars on the best you can find. (Something a *lot* of people seem to be doing).

Most electronic keyers have as a part of their design a thing called a dot-memory. Imagine you are going to send a 'k'. You can close the dash paddle then the dot paddle, then the dash paddle again! The timing of the dot is in the order of milliseconds. With dot-memory you close the dot paddle anytime after the dash paddle and up to when it is needed after the dash, this gives you nearly four times the leeway in timing, which can be critical on a slap paddle. What happens, is the keyer holds the instruction from the dot paddle in memory until the correct time (after the dash) to send it. That little dot will be sent, even if you have closed the dash paddle again before it is sent. It is also why the keyer sends iambicly (remember didahdidahdidah) and some blurb sheets refer to it as a dot-dash memory. To confuse people like me I guess!

The classic example of the advantage of using iambic sending is illustrated in the letters c and q. In conventional manual or slap keying the operator moves the lever to the dash side, the dot side, the dash side and back to the dot side before releasing (for a c). Then back to the dash side twice, or hold these for two dashes, over to the dot side, back to the dash side and then release. Result, CQ, the most commonly sent letters in eight movements.

The iambic operator merely squeezes the two paddles, making sure to lead with the dash paddle, waits until the second dot starts, and releases both paddles together. After waiting for a 'letter' space the dash paddle is pressed and held, and after the second dash starts, gives a flick on the dot paddle, finally releasing the dash paddle when the dot is sent. Result, economy in motion.

Here are a few tips which may be helpful if you wish to convert from non-iambic to iambic sending. Stick with your decision and retire your old paddle to the cupboard, your old habits will be impossibly hard to break if you keep going back to them. For the first few days try to relax and just send CW until you get used to the feel of the new paddles. This is best done off-air, perhaps reading from a book, until you make few mistakes. When you have time to think you can start by thinking about one letter at a time and after a little exclusive practice on that letter, you can start sending it iambicly in context. You may feel like trying more at one time but I recommend sticking with the one letter until you can send it iambicly without thinking, then go on to the next. I started with k and r then added c and full stop and left f and l to the last as they seemed to me to be the most difficult. Don't be discouraged if you occasionally slip back to the old habits on one or two letters, especially if you are excited at the time. This usually means you are like me and not getting enough practice, nothing more.

If you are already using iambic techniques there is another choice to make when selecting a keyer. You may have heard about the type "A" and type "B" devices from Curtis Electro Devices. It is very hard to describe the difference but the type "B" device is explained as adding an element of the opposite type when you release the paddles. If you are a type "B" operator and you run across a type "A" device try sending "CQ". If the device is type "A", you will probably get "KG" or possibly "KQ". If you are a type "A" operator you will probably get an extra dash a the end. Most in-built keyers and memory keyers on the market are type "B" so if you must choose, I suggest starting with the most common. The new 8044 ABM chip has both and the "A" type seems much harder to use to me. The effect is similar to that which I get when I switch off the dot-dash memory on my ETM-8C keyer.

The other feature which many people will have seen is the auto-word-space as found on the accukeyer kits. (EA March 1978, I think).

Auto-word-spacing is a very handy feature in that it makes the sending less critical for perfect Morse. I wonder why it is not incorporated on the Curtis chip? What happens is that the keyer remembers when the last character or element was sent, and if the next element is sent too late (longer than three dot lengths is the letter spacing if I remember correctly) the keyer waits a further few dot lengths before starting to send the next element. That is, provided you wait a little longer than a letter space you will automatically get a full word space. This feature is excellent for speeds up to about 30 words per minute after which, depending on your expertise and your paddle, mistakes such as "ET" when you want "A" or "EQ" when you want a "P". At this time you will be going pretty fast anyway and should be able to handle the word spacing without help so you can switch the auto-word-spacing off.

If you are like me you will have two or three keyers and assorted paddles, maybe all on the bench at the same time, with the hand pump tucked away in the corner somewhere. Iambic keyers are for the lazy, if you want to send reasonably good Morse for the least energy output, then they are for you. I have nothing against the hand key or the purists who don't want to give them up. It is a welcome change to reach for the old brass key and have a try from time to time, but for efficiency, the only way to beat the keyer and paddle combination is to use a computer or keyboard. And that is not hand sending, so it seems to lose a bit of the fun. I am a little surprised that they are not as yet allowed when taking the licence examinations.

A new approach to electronic keyers is the "Triambic Keyer" featured in *Practical Wireless* February 1985, by Mike Rhodes G4FMS. Unfortunately, his article is copyright but if you care to drop me a line expressing your interest, I will see if I can arrange a reprint and maybe some details on any kits.

73, Gil VK3CQ

ar

Club Corner

BALLARAT AMATEUR RADIO GROUP

The Ballarat Amateur Radio Group again held their annual Hamvention on Sunday, October 30.

This year's event attracted a huge group of amateurs and their families from most Australian States.

The hall was packed with well-stocked trade displays who had a steady stream of buyers despite stiff-competition from others with pre-loved equipment and treasures-of-the-past.

The display of packet radio, by Peter VK3AVE, gave many amateurs the urge to fire up on the packet radio mode.

The Department of Transport and Communication also gave a great display of information in hand-out form while Ian VK3AXH and Merv VK3AW, answered many questions on the new regulations. BARG ladies again served up 300 of their famous barbeque lunches along with afternoon tea.

The outstanding fox-hunter of the day was Greg VK3BZQ, with the runner-up being Tom VK5EE.

Winner of the club raffle was Fred VK3KQF, while Franz VK3DVD won the door prize.

The Ballarat Hamvention continues to attract a great number of exhibitors and visitors and is a great example of amateur radio fellowship.

The Ballarat amateurs look forward to enjoying the company of fellow amateur radio operators again this year. Thank you all for making this Hamvention another great day for amateur radio!

—Contributed by Kevin Hughes VK3WN

ar

NORTH EAST ZONE WIA

Following the AGM of the Zone held on October 30, at the Wangaratta TAFE College, the following members were elected to office:

President — Greg Sargeant VK2EXA
Vice-President — Gil Griffith VK3CQ
Secretary/ — Peter Presutti VK2CIM
Treasurer

I thank the outgoing committee for their past efforts. The next meeting will be at the Benalla Rose Gardens on February 12, 1989. This meeting is hoped to be a family outing.

—Contributed by Peter Presutti VK2CIM, Secretary

ar

JOTA AND THE DARLING DOWNS RADIO CLUB

Once again the ever-ready volunteers of the Darling Downs Radio Club gave their time and loaned and operated their equipment to maintain continuous support over many years to the Scouts and Guides of the Toowoomba area.

One team set up three transmitters and the necessary antennas to cater for the Girl Guides on one side of the city whilst the other team, under canvas, attended to the needs of the combined Scout Olympics and Jamboree on the Air.

An estimated total attendance at both venues was in the vicinity of 700 budding amateurs.

The Olympics were held on the opposite side of the city at the Newtown Football Oval. Some of the members worked for two or three days to make the event run as efficiently as possible, in spite of Murphy!

Graham VK4AGN and Dereck (the Treasurer), put in many arduous and busy hours to enable the Guides and Brownies to participate in JOTA, whilst Tom VK4BTW, Keith VK4NCM, Theo VK4KHM and Eric VK4ADA, worked arduously at their transceivers using both the club call sign, VK4WID, and their own to keep up with the steady stream of microphone-shy youngsters.

It was felt that visits to various Scout huts to demonstrate microphone technique and procedure prior to subsequent JOTAs would be a definite advantage.

Valuable help was given by club members, David and Col, whose attendance and assistance was greatly appreciated by the busy operators.

The club looks forward to continuing to support these very worthwhile organisations in the future.

—Contributed by Eric Wissemann VK4ADA, Public Relations Manager, DDRC

ar

GOSFORD FIELD DAY

The club holds a Field Day annually on the Sunday following the third Friday in February each year. This is usually attended by 700 to 900 persons and is recognised as being one of (if not THE) best amateur field days in Australia. A wide range of the latest equipment is displayed by traders, events such as fox-hunts are held and as many as 1000 pre-loved items are lodged for sale through the "Disposals" section for a small charge. If you would like to know more, send a SASE to the Field Manager, PO Box 238, Gosford, NSW. 2250. Many amateurs make a point of holidaying on the Central Coast at the time of the Field Day. Why not you? ? ?

ar

SOUTHERN PENINSULA AMATEUR RADIO CLUB (SPARC)

The Southern Peninsula Amateur Radio Club on Victoria's Mornington Peninsula, decided to try something new and invite primary school students to day-time lectures and hands-on experience of amateur radio.

SPARC received a warm response to the idea from local schools. Groups of sixth grade pupils visit the club's rooms for one hour sessions, which include an introductory lecture on radio and electronics, followed by actual on-air contacts.

Car transport for these unique school excursions has been provided by parents. The students receive a printed confirmation of having participated.

The schools involved have been Eastbourne, Dromana, Rye, Tootgarook and Rosebud. Eastbourne Primary School deputy principal, Wal Bernal said: It's an excellent activity."

The idea is to broaden the horizons of the children and give them an awareness of communication, Mr Bernal said.

SPARC Publicity Officer, Joe Donald VK3AXM, said the exercise had proved very successful and could be adopted by other amateur radio clubs to promote the hobby in their area.

He said SPARC wants to exchange its ideas and experience with other clubs, and would like to see a regular net set up to allow students to have on-air contacts on a prearranged basis.

The Southern Peninsula Amateur Radio Club address is Post Office Box 206, Rosebud, Vic. 3939.

ar

TOWNSVILLE AMATEUR RADIO CLUB
POSITIONS FILLED AT ANNUAL GENERAL MEETING

About 50 members and families attended the recent Annual General Meeting of the Townsville Amateur Radio Club. The meeting was held at the James Cook University Club, and followed a dinner evening. An indication of the stability of the TARC was the attendance at the meeting of six past presidents.

A total of 31 positions were filled for the coming year's activities, as shown below. This incredible result gives a good indication of the continuing support for the club.

President	Rob Male VK4MRE
Vice-President	Evelyn Bahr VK4EQ
	Geoff Chapman VK4CET
Secretary	Ken Morris VK4KWM
Treasurer	Ian Sutton VK4ZT
Publicity Officer	Peter Renton VK4PV
Class Manager	Rob Male VK4MRE

Phil Carne VK3AAM, with students from Eastbourne Primary School, at the SPARC Clubrooms. The pupils get some hands-on experience with radio equipment under the watchful eye of the licenced members of the club.

Editor	Iain Morrison VK4KIG
Librarian	Mike O'Keefe VK4YOB
Station Manager	John Stevens VK4AFS
Club WICEN Co-ordinator	Ian Sutton VK4ZT
WICEN Co-ordinator Region 1A	John Stevens VK4AFS
Deputy WICEN Co-ordinator Region 1A	Gary Kimber VK4KGK
Intruder Watch Co-ordinator	to be advised
Committee Members	Graeme Wilson VK4FXL
	Terry Merritt VK4YTM
	Bob Mann VK4WJ
	Roger Cordukes VK4CD
Slow Morse Co-ordinator	Bill Sebbens VK4XZ
Slow Morse Operators	Alan Stephenson VK4PS
	Vern Crabb VK4FVC
	Charlie Bahr VK4BQ
	Noel Kohler VK4BDV
	Col Hayes VK4FUV
	Neil Butterworth VK4AQD
Auditor	to be advised
QSL Officer	Robin Pollet VK4KRP
Disposals Officer	Bill Sebbens VK4XZ
Activities Officers	Geoff Chapman VK4CET
	Bob Mann VK4WJ
Life Member (recognised)	Evelyn Bahr VK4EQ
Honorary Members (confirmed)	Professor Jim Ward
	Tom Gaveston
Trustees	Alan Stephenson VK4PS
	Charlie Bahr VK4BQ
	Jim Sturges VK4DH

The president for the preceding 12 months, Evelyn Bahr VK4EQ, read the President's Report as follows:

It is my pleasure to present this report on the activities of the Townsville Amateur Radio Club during this the Bicentennial year of 1988.

On the whole, we have had a good year, with just a few worries. A letter from Telecom advising us of the installation of a paging system at Mount Inkerman, differing only by 62 kHz from our two metre repeater, and then advice from the Department of Transport and Communications requesting our amateur television repeater be turned off for a commercial service to carry out field strength tests, have been of some concern. So much for band sharing, but negotiations will continue on these issues.

Mount Stuart, Mount Saint John and Mount Inkerman still house our repeaters and beacons. There have been many working bees to keep the sites and equipment up to standard. We now have a digipeater operational, and as well we have purchased a transceiver with six metre capabilities. This should especially be very handy for field days.

Again this year we were participants in the John Moyle Field Day, and as usual it was a wonderful family weekend. Our yearly trip to Mission Beach was another great success. This year we conducted a raffle, and the drawing took place on the Sunday evening. Thank you to our donor and to all those who supported us. The Bowen Club was most generous in their hospitality, when we paid them a weekend visit.

Our monthly meetings have been quite well supported and, on almost every occasion, we have had a guest speaker. Subject matters have been varied and interesting. These have included paging systems, AUSSAT satellite and its part in the Australia-wide television hook-up, Airport and Aircraft communications, computer log keeping for the Remembrance Day Contest, VHF and Wireless Institute matters and pre-war memories of Townsville and early Radio Teletype work.

As the sunspot cycle changes, the bands have become much more active, and this is reflected in the number of QSL cards being handled.

We all look forward to receiving our backscatter each month, and it is pleasing to note many more technical articles appearing. Keep up the good work.

Jamboree on the Air was again a feature on our calendar, and quite a few of our members participated.

The idea of the TAFE running a class on amateur radio was not widely accepted, and so once again, we are conducting our own classes. The slow Morse operators are also doing their part to help newcomers.

This year we have held two displays. The first was the Leisureama held at Lavarack Barracks, followed four months later by the Bicentennial Display at North Ward. Both were successful, but a great deal more effort went into the latter. Many articles of historical interest, as well as modern equipment was featured. Without a doubt it created much interest and over 500 contacts were made using the special call sign, VI88QLD.

Unfortunately, incorporation has not eventuated as yet. The sub-committee has done many hours of work, and we feel sure the matter will be resolved in the near future.

Much work is still to be done, and it is interesting to notice the priorities of our technical committee. May the list grow much smaller in the near future.

WICEN has again been a feature of our year's activities. Our portable repeater has been used with much success in exercises at Bluewater, Major's Creek and Hervey's Range. However, it was of immense importance during the recent search for a woman lost at Mount Spec. Many of our members spent many days in the area, whilst others loaned hand-helds and equipment. It is a tragedy that the work was to no avail, but we do sincerely thank those who assisted.

No names have been mentioned in this report, because you have been a great team working together. To you all collectively may I thank you for your help and support. Here's to another great year coming up.

Evelyn Bahr VK4EQ, President.

—Contributed by Peter Renton VK4PV, Publicity Officer, TARC

ar

MACKAY & CENTRAL QUEENSLAND DIVISION WIA (Rockhampton)

The Mackay and Central Queensland Division WIA (Rockhampton) have been holding an annual get-together at a small coastal report called Clairview for the last five years. The last meeting was held over the weekend, October 22/23, 1988, at the Golden Mermaid Caravan Park. Clairview is located about 210 kilometres north of Rockhampton.

The attendance was gratifying with 29 call signs from 13 different Central Queensland towns and a total 62 adults, plus a number of harmonics enjoying near perfect weather.

Activities included a demonstration of 10 GHz ATV in colour and monochrome by Frank VK4CAU, a very well received and informative demonstration of packet and the temporary installation and successful operation of a digipeater working into a bulletin board at Rockhampton. This was well demonstrated by VK4ZAR, VK4ZHL, VK4JPE, VK4TKA and his son Alister.

For the ladies there was a very well received demonstration of Indonesian Batik styles by Arni, wife of VK4CMA, whilst the children enjoyed the swimming pool.

The usual fox hunters were catered for at a leisurely pace on foot through the grounds of the Caravan Park. The first hunt had a fiendish twist with both a high and low power fox running simultaneously, the high power fox being keyed intermittently. It proved very interesting and more than a little confusing! The three winners were Frank VK4CAU, Dallas VK4BWN and Jeff VK4ABJ.

Saturday even was off to a swing start with barbeque followed by a video showing the erection

The Welcoming Board.

of a new repeater by a helicopter lift from the base of a hill to the site atop. This was presented by Ritchie VK4RR.

Then it was on to the night's main event, an auction of useful, possibly useful and useless pre-loved equipment and some bits and pieces dating back to the 1920s. The ladies and children were catered for here with special interest items and a number of "mystery" items. Auctioneer for the night was Rob VK4TKA, raising $377.50 which was divided between the two clubs.

Many face were put to the Central Queensland call signs at the other end of the QSOs. It may be of interest to note that many of these contacts are being made of late on two metres and 70 centimetres whilst good ducting conditions are present. As a change from coastal ducting, Wally VK4AIV, from Mackay, worked ZL on both two bands and is now anxiously awaiting a return QSL from ZL1TTS in Auckland for confirmation.

One aerial that had outstanding interest for most HF operators was the latest version of the "tractor operator's special" as featured last year in AR and ably explained by Robin VK4FUE, who wrote the original article. When asked where he got the idea, he answered he just thought of it and there was plenty of time to think when driving a tractor! It seems incredible how simple and quick it is to change bands and retune the aerial remotely from the driving seat and be on your way again on any band from 10 to 160 metres.

Well, all good things come to an end and it was with much reluctance that most packed up and departed throughout Sunday. There was only one thing to mar the weekend and that was the news that Ritchie VK4RR's, father-in-law, George Eves VK4FGE, aged 82, had passed away. George is survived by six licensed amateurs, either directly or by marriage. They are: VK4s — RR, KIZ, FFQ, ATY, DY and VK2DNI. To them all and the rest of George's family we extend our sympathy for their sad loss.

Now that the weekend is over everyone is looking forward to a bigger, brighter and more fun-filled weekend next year and we hope to see some interstate visitors next time!

I was pleasing to see John VK3ZFN, this time, so how about a few more out-of-staters next year? You can be assured you will enjoy yourself.

—Words contributed by Ted Roberts VK4QI, photographs by David Christmas VK4MQC

ar

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

Hello and welcome to 1989. These notes were prepared early in November with a longer than usual lead time. New member listings for November and December will be included in the February notes.

VK2 AWARDS

The award "Bicentenary of Australia — 1788-1988" which requires either VK2 amateurs to contact 200 other amateurs, or those outside to work 200 VK2s, ended on December 31. Claims must reach the Awards Manager, PO Box 1066, Parramatta, NSW. 2150 by June 30, 1989. From the start of 1989 this award is replaced with a worked VK2 Award. Further details may appear in a following Awards Column.

BROADCASTS

The VK2WI news sessions for 1989 resume on Sunday, January 8, 1989. A reminder that the NSW Division telephone news headlines are available on (02) 651 1489. Should any item of importance occur during the Christmas break, it will be included on the tape. The start of 1989 is also the change-back to the VK prefix in place of the optional AX prefix. There may be some special operation from VK2WI on Australia Day. The broadcasts will advise.

FIELD DAYS

A reminder that the Gosford Field Day will be held at the Gosford Showground on Sunday, February 19.

Wagga Amateur Radio Club held a well-attended two-day field over the weekend of November 5-6. They hope to be able to hold another about November 1989. A report will appear in a later AR.

Don't forget to plan for the Urunga Convention at Easter and the Oxley Region at Port Macquarie in June.

NEW DIVISIONAL YEAR

A reminder to members that the new Divisional year commenced on January 1, 1989. The Annual General Meeting will be held about April. Reports should now be submitted to the Secretary for inclusion in the annual report. It is also time to start thinking about election of the new council.

The Divisional fee structure for 1989 is $41.50 for full members, $39.50 Associate and $34.50 Pensioner grade. The Federal component is $33.00. The balance is what the Division receives. If you are on annual billing, that is, your subscription becomes due on January 1, I hope that you have already paid and perhaps taken advantage of the three-year option.

ROSS HULL CONTEST

If possible, take part in this annual event and help populate the six metre band. It should be noted however, that no VK2 operation is permitted below 52 MHz while there is *any* Channel 0 transmitter on air.

The Postcode Contest on December 30 was six metres all mode. The Postcode Contest for January will be the last Friday, January 27, between 9 and 11 pm.

ar

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

MEMBERSHIP SUBSCRIPTIONS

It is again that time of the year when most of us should have very recently renewed our membership for a further 12 months.

In this age and economic climate, it is understandable if some of us find it increasingly difficult to find the appropriate sum of money.

The WIA Victorian Division realise that some of its pensioner-grade members face financial hardship. Pensioner grade members can now pay their 1989 membership subscription in two equal six monthly installments. This option is only available to pensioner grade members who are in financial difficulty.

QSL BUREAUS

VK3BWI has recently broadcast a series of articles entitled "How to use the VK3 QSL Bureau".

The response to this series has led us to realise that there are many members who do not know how to best avail themselves of these valuable services.

Information sheets are now available explaining all the details of operation of the bureaus.

If you would like one, please drop a line to the Victorian Divisional Secretary and one will be sent to you.

Members will be notified of the new address of the Victorian Divisional Headquarters through this publication and via the Sunday Morning Broadcast.

WEEKLY NEW BROADCAST

VK3BWI, the broadcast station of the Wireless Institute of Australia, Victorian Division transmits news and information of interest to amateur radio operators and shortwave listeners at 10.30 am (local time) every Sunday morning.

The bulletin usually runs for about 40 minutes, and may be received via the following outlets:

1.840 MHz AM from Lyndhurst
3.615 MHz LSB from Lyndhurst
7.085 MHz relayed via VK3RC near Seymour
and via two metre repeaters:
VK3RMM, Mount Macedon
VK3RWG, Mount Baw Baw
VK3RMA, Mildura
and via the 70 centimetre repeater VK3RMU, Mount Saint Leonard.

Call backs are conducted on 80 metres, 40 metres and on two metres (VK3RMM) after the broadcast.

—Contributed by Bill Trigg VK3PTW

ar

THREE-YEAR MEMBERSHIP OF THE WIA

If you are a Full, Associate, Pensioner, or Family member of the Institute, and your membership renewal is due on or after January 1, 1989, you will be able to avail yourself of a new facility for members.

A three-year membership.

If you want to renew your membership for three years, instead of just one year, simply multiply the amount appearing on your membership renewal notice by three and forward your payment to the Federal Office in the usual manner.

Obviously, with inflation and fees rising each year, this facility will save you money.

ar

ANTENNA IMPEDANCE METER

S E Widgery VK3SE
8 York Street, Ballarat, Vic. 3350

Feed RF into input terminals, calibrate with non-inductive resistors and mark dial according to Ohms, connected to unknown terminals. It will read about five to 500 Ohms. Calibrate the dial in Ohms. Once calibrated, use it for antenna impedance measurements. Used with low power RF, it will tell you the impedance of your antenna at a given frequency.

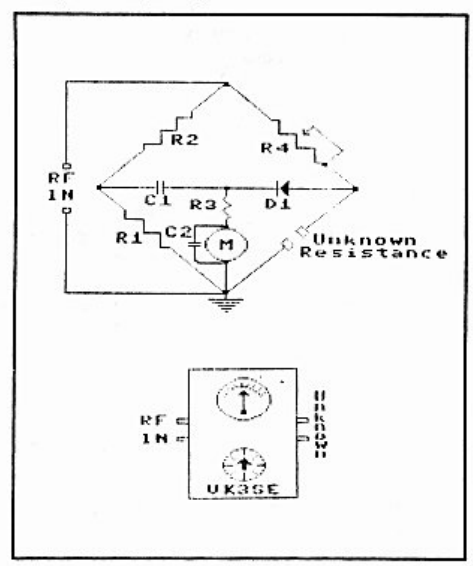


Figure 1.

R1-R2	200 Ohms.
R3	10 k Ohms.
R4	500 Ohm carbon pot only.
M	0-100 uA meter.
C1-C2	0.047 uF discs.
D1	OA85, OA95 or similar Germanium diode only.

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

A very happy 1989 to you all, and may it be a god year for amateur radio (both the magazine and the hobby!) and the WIA in particular.

As part of our policy of giving members more for their money, or the non-member less, as from January 1, 1989, outwards QSL cards can only be sent through the VK5 Bureau by *WIA members*. And how (you may ask) do I prove I am a member? All cards passing out through the bureau must now bear a sticker. These stickers can be purchased through *John Gardiner VK5KJG*, the *Publications Officer*. John will check your name on a current EDP listing either at the meeting or when you apply to him by mail. You could also speed the process (particularly at meetings) by producing your current AR label.

As far as I am aware at this stage, the stickers will only be available from John Gardiner — not John Gough, the QSL Bureau Manager. They will be sold in rolls of 100 stickers for $5. We hope that the new system can be implemented without too many hiccups, but please bear with us if there are a few.

I would like to remind you that we are still looking for a Program Organiser and (at the time of writing) a *Broadcast Producer* for the Sunday Morning Broadcast (though hopefully, we will have filled one or both by the time you are reading this). Also, I have still only received one photograph of a past-president of this Division, that is Tom Laidler VK5TL. We deferred having Tom's photo framed so that we could have them *all* done together!

HOBBIES DISPLAY AT THE INTERNATIONAL EXPO

At this year's International Expo, at Wayville Showgrounds from May 12 to 21, they intend to have a section devoted to hobbies. We have been asked if we would be interested in having a stand showing amateur radio, etc. We feel that this is an opportunity that is too good to miss, but as usual, the main need will be "person power". It will not be easy finding enough people to run it for 10 days but we are hoping that perhaps the clubs can help with this. We have the display boards and we have the pamphlets, etc, but a static display is not really a great deal of use, visitors need to be able to talk to amateurs about the hobby and to be enthused by them.

There must be plenty of retired people who could be there during the day, and the non-retired could take over at night, so how about letting Council know if you (as an individual) or your club would be willing to help.

DIARY DATES

Tuesday, January 24. *Buy and Sell Meeting* — at the BGB. This will be preceded by ESC, QSL Bureau and Publications Sales (not forgetting the QSL stickers). We will endeavour to start at 7.30 pm.

Tuesday, January 31. No meeting!

ar

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!

20 AMP POWER SUPPLY

by Doug Friend VK4AIZ

I refer to the Moorabbin and District Radio Club project article on pages 4-6 of August AR, I have constructed a power supply recently of my own design, but largely following the 723 and protection circuits published in the article.

I am writing to report that I found the design (I don't think it was my PCB design or wiring layout) susceptible to RF energy, notably at HF frequencies. The cure of the problem has been to place a 4µ7 25 volt tag tantalum capacitor between pin 3 of the 723 and earth, with short leads right at the IC pin itself.

I hope that this information may benefit other constructors attempting this, or a similar project.

Incidentally, my design uses a toroidal transformer, Schottky diodes and two MJ802 final output regulator transistors for a very compact and low heat dissipation supply.

Best wishes and thanks for the magazine.

Yours sincerely

Doug Friend VK4AIZ
35 Cronin Street
Annerley, Qld. 4103

ar

MAY I BE PERMITTED

by Terry Robinson VK3DWZ

The 20 metre band is wide open. DX is rolling in from everywhere. Suddenly I happen upon a station calling "CQ Contest". I tune a bit further. More of the same. Then I notice the band is filled with "contesters". Wherever I tune I cannot escape them!

Sounds like fiction. No, it is a sad scenario that greets me every time I wish to work DX on the weekends.

Surely the time has come to call a halt to the ever-increasing number of contests that jam up our bands *every* weekend.

As a start, may I be permitted to offer the following set of rules that should be observed by *every* contestant:

1. No more than *eight* hours of operation by permitted (four hours a day).
2. Strict "frequency limits" to be observed, eg on 20 metres SSB, 14.150-14.250 MHz.
3. Contestants *compelled* to realise that many amateurs are *not* interested in their contest.
4. *Two* weekends a year (*only*) to be set aside for *all* contests. Absolutely *no* contest is to be held on *any other* weekend.

I realise that the above will probably make me unpopular, but I would like to work *some DX* on the weekends without fighting it out amongst any number of contestants.

Finally, the *worst* person on our bands is a tired, cranky operator near the end of a long contest. These people give our hobby a bad name.

Yours faithfully

Terry Robinson VK3DWZ
21 Russell Avenue,
Woodend, Vic. 3442

ar

EXPERIENCING JOTA

by Ormond Guy VK3ASY

The experience of participating in JOTA was, for me, an enriching one. I did not have Guides or Scouts with me in my shack but decided to act as a contact for stations where the young people were willing to have the experience.

On the Saturday, I made three contacts and was able to note the different styles of operation of the amateur operators.

Basically, there are two distinct styles:

1. The operator interviews, and
2. The guests take the mic.

Where the operator interviews the guests, it is a case of what is your name; do you like being a Cub/Brownie; what is your age? The guest answers in monosyllables or just a few words.

Where the guests take the microphone and, providing they have had some instruction beforehand, they ask questions, tell some details of themselves and say "Over". The receiving guest responds, or as in my case, I acknowledged the detail and asked further questions. I was able to draw the guests out so much so that by the end of about four to six guests having spoken in the presence of the rest of the group, the ones remaining to have their turn were more self-confident than the ones who came on earlier.

In this way, the youngsters learned quite an amount of communication technique and definitely learned that the microphone doesn't bite!

For my part, I felt a sense of satisfaction that I had helped a group of 10-11 year old Guides to speak on the air. Next year, all being well, I will either invite a few Scout/Guide members into my station or will set up the station at a hall.

But, I think it is essential to have some time with the guests first so that they can prepare their lines of questioning in advance and thus avoid the "hello" "over" "yes" "over" style of contact. The amateur operator can prepare a list of statements/questions so each guest can gradually develop a comfortable feeling.

There is no doubt about it, JOTA can be a great learning experience for the youth, but we as operators need to learn the techniques that will help with the learning.

Yours sincerely

Ormond Guy VK3ASY
10/276 Dorset Road
Croydon, Vic. 3136

ar

AMATEUR PERFORMANCE?

by Peter Parker VK6BWI

With a WARC looming in a few years time, governments around the world will be assessing the performance of the amateur fraternity. This performance will be determined by how well we fulfill our role in the complex web of international communications.

Governments world-wide will be looking at how well we work towards the following three objectives:

1. to carry out technical investigation
2. To communicate
3. To train ourselves continually for the above.

Australian amateurs and the WIA must ask themselves, "How well do we satisfy these requirements?"

I would suggest that, with the possible exception of the second point, Australian amateurs, as a group, perform poorly in the above.

Many amateurs may think that, if they donate some money to the WARC fund, everything will be alright. Sometimes this may be sufficient as (seemingly) in WARC 79, but there are indications that this may not apply to the next WARC. Certainly, WIA and IARU delegates are important to the future of the amateur service, but we are giving ourselves less than a good chance is we ignore the grass-roots of our fraternity, operators like you and me, and how well we fulfill our purpose.

The amateur service is being subsidised by Australian taxpayers and they have a right to an efficient and dynamic amateur service, a worthwhile national resource.

And, what can you do? Make a New Year resolution to build a transmitter, try ATV, join WICEN or the ATN (this is not an invitation for yet another debate on message handling, etc), get your CW up to 20 words per minute, transmit on 10 GHz or get your full call, etc. All of these are valid aspects of the amateur service and you will be contributing to our well-being if you take up the challenge.

All the very best for the New Year.

Peter Parker VK6BWI
C/- Post Office
Witchcliffe, WA. 6286

ar

MORSE PROCEDURE SCHOOL

by Peter O'Brien VK2YZD

Obtaining a licence of whatever grade is one thing; getting used to on-air practices and jargon, especially in Morse, is quite another. I suspect that almost all new amateurs have had their enthusiasm dampened by contacts spoiled because they were jumbled, and ended up in irritation and frustration on both sides.

You only learn on-air practices by being on-air, I hear you say? Not so. These days, people are running residential schools in every subject from Beekeeping to Yoga. All that is needed is to book the required number of on-site vans in a caravan park which has a community hall the school can use in case of rain. If it is at a beach so much the better because children and spouses have something to do. You also need top instructors of course, but with the number of people learning what training feats were performed in the services (10 WPM in as many weeks — letters AR No 10), this shouldn't be a problem. Surely over a weekend, enough guided practice could be had to make a newcomer confident and over a week; to get someone with five words per minute up to 12, say.

Having attended such schools in other subjects, I can say that everyone; instructors, participants and families, have a great time and the pupils learn at a tremendous rate. The special advantage of an AR school is that it needn't take up air space; practice can be done by local hook-up or very low power.

A certain amount of organising would be needed, of course. Getting pupils and instructors, preparing a program, collecting equipment, selecting a venue, collecting advance payments for the vans and van-sites. It would need to draw on a bigger pool of amateurs than just one club; therefore the WIA might have to take it on; but it would be well worth it in publicity amongst unaffiliated amateurs.

Yours faithfully

Peter O'Brien VK2YZD
27 Park Avenue
Chatswood, NSW. 2067

ar

NAVIGATION, NETS, ETC

by Donald Hopper VK4NN

With reference to *Topical Technicalities* by Lindsay Lawless VK3ANJ, in August 1988 issue of *Amateur Radio*, I offer the following information regarding the *lunar observations* and *tables* as used by

Captain Joshua Slocum in 1898, and comment on other aspect mentioned.

Lunar distance is the distance between the Moon and the Sun, Star or Planet, used at sea before the advent of reliable chronometers or timekeepers, for determination of Greenwich Mean Time (GMT) in connection with finding the ship's longitude.

With the sextant an observation was taken between the Moon's illuminated limb and the nearest limb of the Sun or centre of a star or planet. The value of this observation was converted to true or geocentric distance for comparison with that given in the Nautical Almanac as occurring at a certain Greenwich Mean Time.

Geocentric Lunar Distances were given in the Nautical Almanac for every third hour for the Sun, Venus, Mars, Jupiter, Saturn and certain selected stars.

Lunar observations For a solo sailor there was a time lapse between measuring the Lunar Distance and the taking of the Lunar Observation.

The rate of change in the Moon's angular distance from another body in, or near its orbit is about half a minute of arc in one minute of time, resulting in a longitude error of 30 times an error in the observed distance. It can be appreciated that, with a possibility of a two minute discrepancy in sextant observations under a solo sailor's sea conditions, the resultant longitude could be in error up to one degree. However, the average of several lunar observations and distances east and west of the Moon, or both directions from the moon produced reasonably satisfactory results.

Lunar tables were those used in "clearing distance" or correcting observed Lunar Distance for refraction, parallax and semi- diameter. These tables were finally deleted from the Nautical Almanac in 1913.

The satellite Lindsay referred to used by Captain Joshua Slocum in 1898 to assist in his celestial navigation was of course the Moon, but also involved was a planet or star in or near the Moon's orbit at the time.

The American FCC approved Amateur Radio Maritime Mobile operation in 1932. Initially this involved amateurs who were radio officers on ships. Gradually amateurs on yachts became involved. In the last decade we have seen yachts become dependent on amateur radio for communications at sea. A basic reason for this is the lower cost of amateur radio against the cost of "type approved" commercial radio for communications with Coast Radio Stations.

As a follow-on, we now have yachties obtaining amateur operator's licenses for the sole purpose of marine communications.

This development led to opposition in Australia by some amateurs (including myself) and Coast Radio Station Operators. Finally, the Department of Communications was urged to clarify the situation. After a two-year investigation and consultation with other authorities, the Department advised (M83/973) on April 6, 1984, that it had no objection to the passing of weather information or to the operation of Maritime Mobile Nets, subject to the provisions in the *Amateur Operator's Handbook*. In spite of this clarification, there are amateurs not prepared to accept the Department's ruling and who continue to give Maritime Mobiles a "hard time".

The yachties are currently well catered for during their voyages across the Pacific and Indian Oceans, with the following nets operating — taking position reports and making weather information available. The nets are also used as a contact point for communication with other yachts and shore-based amateurs. The American yachts also take advantage of phone patch facilities to speak with their families in the USA.

Tony's Net — At 2100 UTC on 14.315 MHz. Covering the South-West Pacific. This net is of particular interest to me as from it I contact yachts heading west to Australia and fill out the Sea Safety Report form for Canberra. This form has proved of great value when yachts have had an emergency.

Pacific Maritime Mobile Net — A group of stations in the South West Pacific and in Western Australian interested in safety at sea. My radio shack contains a ship's chart table and marine reference books. Yachts approaching Australia check with me regarding chart amendments in Notice to Mariners, port information, Customs procedures, etc. This group are on 14.315 MHz at 0200 UTC.

Travellers Net — At 0300 UTC on 14.106 MHz. Covering the Western Indian Ocean and northern Australian waters.

Seafarers Net — At 0300 UTC on 14.314 MHz. Covering the Eastern Pacific Ocean.

Pacific Maritime Mobile Net — At 0400 UTC on 14.314 MHz. Covering the Pacific Ocean. I monitor this net noting movement of yachts heading west towards Australia.

German Maritime Mobile Net — On 14.313 MHz at 0600 UTC. Covering the Western Indian Ocean, Mediterranean and Eastern Atlantic Ocean.

South African Net — At 0600 UTC on 14.316 MHz. Covering the Indian Ocean. The Traveller's Net passes yachts heading west from Australia over to this net.

Pacific Inter Island Net — At 0800 UTC on 14.315 MHz and covering the Pacific Ocean.

South African Net — At 1130 UTC on 14.316 MHz covering the Indian Ocean.

There are three "Pirate" nets on 14.320 MHz at 0001, 0400 and 1000 UTC. Unfortunately licenced operators and Australian novices check into these nets. It is not good for the blood pressure to hear pirate net controllers taking position reports from licenced amateurs.

Regarding Lindsay's comment that advances in navigation and radio over the last 90 years are due in no small measure to amateur yachtsmen and amateur radio operators, I find this indeed difficult to accept. In my years of instructing yachtsmen in navigation, I found very few "experienced" yachtsmen who came to me with a good grasp of the science. In fact, I found none who used parallel rules for the placing on or taking off of courses on charts. They all used old sailing ship circular protractors or maybe a fancy protractor such as the "Jean Cras".

I recall one emergency involving a yacht crew who had a sextant but could not do the calculations to establish a position line so I did the calculations for them. I asked yachts in the South West Pacific monitoring the drama to also do the calculations. Only one yacht with a lady navigator did the calculations accurately and she used a navigation computer. One chap did not even know how to use the Nautical Almanac.

I cannot guess as to how amateur yachtsmen could have contributed anything to the development of the sextant, chronometer, computed tables of altitude and azimuth, Omega, Loran, Satellite Navigation or navigation computers.

On the communications aspect, I cannot think of any contribution a non-professional (radio) amateur radio operator on a yacht could have made to the advancement of marine communications, except the establishment of maritime mobile nets.

In 50 years of membership of the IEEE (IRE) I have not seen one article written by a yachting amateur radio operator in the Institutes publications.

Keep up the good work Lindsay, *Topical Technicalities* are always of interest.

Don Hopper VK4NN
23 Lloyds Road
Springbrook, Qld. 4213

ar

* * *

SUBMISSION ON PACKET

by John Dowsett VK6UD

While acknowledging that there is a problem of mutual interference on 20 metres between packet operation and that of SSB, we believe the problem cannot be solved by the WIA in this State or in AUstralia, as the solution is by agreement of all amateur radio bodies in all three regions of the IARU.

Members of the Southern Electronics Group support the Travellers' Net, and some have been users of this very worthwhile facility over many years. There is no simple answer to the present problem, and to find a possible solution we have to look at the overall band usage.

It has been evident that packet is the fastest growing mode in amateur radio with the number of stations participating world wide increasing each week, and with the growing number of multi-mode "Black Boxes" being used, there is evidence that the previous decline of RTTY and AMTOR is starting to change with mode signals appearing in the upper part of 14.000 to 14.100 MHz. This should increase into the future. While the 30 kHz may seem a lot for these two modes, each contact requires a clear channel, making provision for only a limited number of stations to fill the segment. Packet operation by its nature is able to have numerous contacts operate on the same frequency, giving greater usage of any frequency segment. With the possibility of future additional digital modes being introduced, there is a need to provide for future growth.

Were it not for the comparatively recent expansion of the American phone operation down to 14.150 from 14.200 MHz, there could have been reasonable argument to provide for packet operation from 14.100 to 14.125 MHz, thus giving the SSB operators world-wide, 75 kHz for communication with other low power SSB operators away from the "Californian Kilowatts". Presently there is only 50 kHz for this operation as well as packet.

When we consider that 200 kHz for SSB is set aside for less than 30 percent of the world amateur population to communicate between themselves and the world, while 70 percent of the amateur population have to try and communicate on SSB together with packet in 50 kHz the inequality becomes obvious.

What really needs to be done is for the Americans to give up say, 25 kHz by having each of the three class bottom boundaries move up 25 kHz for SSB, provide for 14.100 to 14.125 MHz exclusive packet (digital modes) operation, leaving 50 kHz available for 70 percent of the world amateurs for SSB communications between themselves when they wish, without interference from either packet or the "Californian Kilowatts".

For this to be achieved, we believe the WIA should adopt a policy along these lines and endeavour to have this proposal adopted as Region 3 policy at the next Region 3 Conference later this year, while at the same time endeavour to have Region 1 and 2 adopt the same policy. (At the Region 3 Conference in October, an upper limit for digital modes of 14.122 MHz was recommended. Ed).

This would entail the Travellers' Net being relocated in the lower part of the new SSB segment, close to 14.125 MHz (or 14.112 if the R3 recommendation is adopted. Ed).

If this proposal has the support of the WIA, then consideration could be given to early relocation of the Travellers' Net to alleviate the current mutual interference condition.

In addition to this proposal, we further request that an agenda item for the next Federal Convention be submitted:

> Make whatever moves are necessary, for an extension of 150 kHz to the top end of the 20 metre band at the next proposed WARC.

This will obtain bandwidth compatibility with 15 metres and provide for less interference between stations as this band has greatest usage worldwide, being used at all phases of the sunspot cycle. (There seems some confusion here. The proposal would make 20 metres 500 kHz wide. Width of 15 metres is 450 kHz. Ed).

Neither of these proposals is going to be achieved in the short term; but if the proposals are seen to be desirable, then all efforts should be made to have them implemented.

John Dowsett VK6UD
Honorary Secretary
Southern Electronics Group
PO Box 664
Albany, WA. 6330

ar

MORE ON KEY CLICKS

by Lindsay Lawless VK3ANJ

This is an interim response to the letter from Jeff VK2BYY of the October 1988 AR.

I am aware of the theoretical spectrum resulting from rectangular pulse modulation of a carrier. The frequency spectrum and sideband energy distribution depends on the pulse duration, the duty cycle and the PRF; those parameters are almost random in a manual telegraph transmission. Spectral analysis of that sort of transmission, together with the fact of low level band pass filters followed by a linear amplifier and aerial coupling unit and resonant aerial band pass filtering and not forgetting receiver response, indicate that the popular theory may be incomplete or incorrect.

The explanation given in my Topical Technicalities of August AR was copied from the Royal Air Force Signal manual. The RAF was often the "only one in step" and their theory didn't have the merit of popularity, nevertheless it is worth considering in the light of the deficiencies of the popular theory. The popularity of a theory is often its only merit.

With your concurrence I will pursue the matter in more detail in a future TT. Meantime, I reassure readers that TT remains undeterred by the risk of spreading "horror and dismay" among our savants and dogmatists. I hope that most members keep up the amateur tradition with similar inclinations and that your editorial policies continue to foster an open minded spirit of inquiry. If we ever have technical censorship forced on us it will surely kill enthusiasm and a large proportion of the enjoyment.

Yours sincerely
Lindsay Lawless VK3ANJ
PO Box 112
Lakes Entrance, Vic. 3909

ar

CONSIDER. . .

by Peter Tomsett VK6AAL

It is a healthy sign to see the survey in AR. I can only hope it does not suffer from apathy in its return.

I have a suggestion I wish to air. A large number of our members are suffering considerable harassment by shire councils and other government planning bodies with relation to the erection of radio masts. It is a well-known fact that *justice* is only available to those who can afford it. The situation is usually a case of one poorly financed amateur fighting a very well financially supported shire. The outcome is inevitable as the limited resources of the victim of bureaucratic injustice are stretched to the limit.

If all amateurs were levied $100, multiply this by the number of amateurs in Australia, and invested it in fixed deposits, you would then have more resources available to the amateur-in-distress than the most powerful shires in this country. Suddenly we, the amateurs, can stop begging for our share of justice and enjoy our hobby for what it is supposed to be — *free of politics, race or discrimination.*

Personally I have succeeded in my bid to erect a mast after considerable compromise, but many have compromised more than myself and are still waiting years later while the poorly financed wheels of justice grind slowly.

This idea requires some considerable thought and refining but it has some unusual potentials. Consider the case of "Amateur Blogs" — a survey shows all neighbours are willing to allow him to erect his mast except for one who is blocking his application through the shire.

COURSE OF ACTION

1. Enter into lengthy expensive litigation with the shire.
2. Try bluffing the neighbour with counter suit of restriction of personal liberties pointing out the resources available to back the action.
3. Neighbour is offered a good price for his property (everyone has their price), house is purchased by the fund, and placed back on the market with a no objection clause in the bill of sale. The loss incurred by the fund, if any, can be absorbed by returns from interest-bearing term deposits. This will obviously require management but has the potential for putting justice back into the affordable bracket for most amateurs.

This service could be made available to all WIA members. It is now we need to insure our very existence in the community with its changing attitudes to restricting peoples' freedom of choice. Amateur radio is in real danger by the fact that it differs greatly from the "norm" and is practiced by a much misrepresented minority.

These are not unsupported words. After considerable expense involved in attaining my Building Permit I have also donated to the local fighting fund for those less fortunate than myself. I only wish all amateurs could see their way clear to spend as little as one tenth of what most amateurs would spend in one year on securing the future of this truly great hobby. Alas, this probably is just a fool's dream, for the only true reality that needs any consideration is that while you sit working your DX, a growing number of amateurs are being denied this pleasure on purely aesthetic grounds.

Yours sincerely
Peter Tomsett VK6AAL
12 Towerhill Road
Alexander Heights, WA. 6064

ar

DISMAL. . .

by Arthur Trevaskis VK7SE

After many years of patience I must put pen to paper. Last weekend, I operated a portable JOTA station (VK7SCM) which involved a group of Venturer Scouts carry all the radio equipment nearly two kilometres up a mountain in near blizzard conditions.

Imagine my dismay when, soon after commencing operation, a station called his mate on a sched, only a few hundred Hertz from me and immediately commenced to complain about the QRM on the frequency. I immediately began calling the stations and it took several overs before I could break in to explain that I was the "QRM". Yes! *I was using the frequency!* Apologies were offered and accepted and they moved as expected of gentlemen. All this was of great amusement to the other party in my QSO.

Another time, I overheard another amateur complaining bitterly to his mate about someone using "their" frequency that they had used for years for their scheds. "What right had these JOTA stations" to use frequencies normally used by others?

I had similar experiences when I took a QRP unit on a touring holiday to the outback on my motorcycle last year. Stations came over the top of me, and when challenged by the more powerful end of my QSO, retorted "Oh I heard him but he was a bit faint".

Gentlemen, if someone is using a frequency, you can't have it. It's as simple as that! Isn't it?

73 to all
Arthur Trevaskis VK7SE
RSD 1745
Penguin, Tas. 7316

ar

RESTRUCTURING

by Garry Page VK3ZGP

I like the style of the VK4XP proposal to restructure the existing licence structure (see October AR), even though I disagree with the details of the theory/modes/bands/power suggestions.

Morse code proficiency is a current requirement of international regulations and reciprocal licensing arrangements. It is not appropriate to delete it from current licence conditions or proposed systems. Access to HF bands should be restricted in line with these regulations.

I do not believe the proposal can be accepted in the suggested form at the present time. A suitable compromise might be:

Cease issuing call signs in the current series.
Create the three level structure with a rationalised call sign series.
Give existing licence holders the option of transferring to their appropriate level and receiving a new call sign.
Any new licences would be granted in the new system
Add Morse code speed as an endorsement to the licence to allow access to the HF bands. The tested Morse code speed is documented without changing call sign. Only change call signs when changing between licence levels.

I believe the licensing system does need to be restructured. As the operator with the worst two metre signal in Melbourne (Motorcycle Mobile), I would not presume to speak for all amateurs, but I believe a variation of the VK4XP proposal should receive serious consideration.

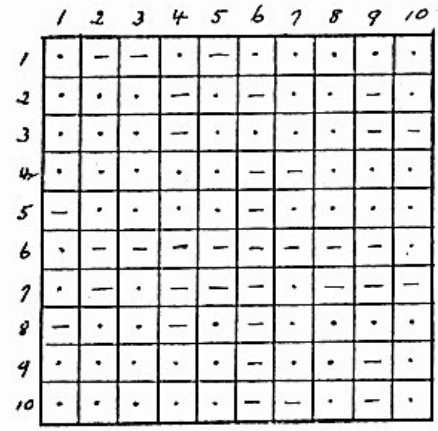
Yours sincerely
Garry Page VK3ZGP
PO Box 575
Clayton, Vic. 3168

ar

SOLUTION TO MORSEWORD 23

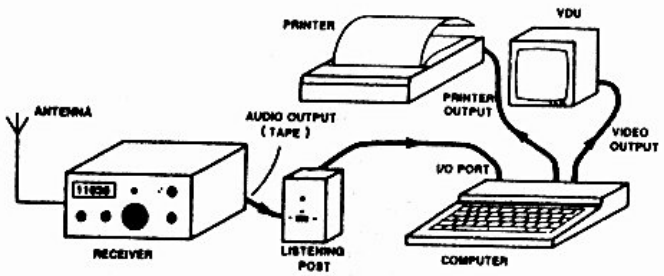
Across: 1 etch 2 stain 3 view 4 seats 5 Beth 6 jog 7 roam 8 tears 9 suite 10 hake

Down: 1 said 2 dims 3 base 4 page 5 bats 6 root 7 vast 8 seems 9 pay 10 fits

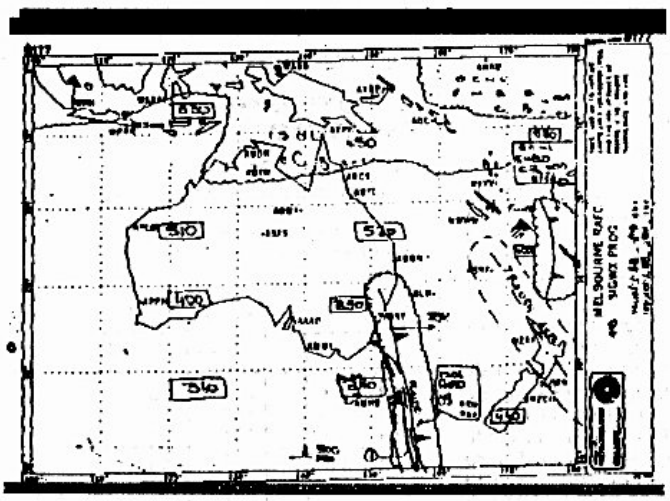


RECEIVE FAX, RTTY & MORSE ON YOUR COMPUTER

Using the Australian Electronics Monthly "Listening Post" (AEM3500) project, you can tune-in to the myriad of non-voice transmissions on shortwave and decode them! All you need is a shortwave receiver with SSB reception, the AEM3500 Listening Post, computer and software. Be the first on your block to receive weather pictures and foreign news bulletins – USEFUL and FASCINATING.



Get the Most Out of Your Receiver!



MONSIEUR LE SECRETAIRE GENERAL, DES VOTRE NOMINATION A LA HAUTE FONCTION QUE VOUS OCCUPEZ VOUS AVEZ MARQUE AVEC FORCE L'IMPORTANCE QUE VOUS ATTACHIEZ A CE QUE L'ORGANISATION RETROUVE LES PRINCIPES QUI L'AVAIENT FONDEE : ''NOUS NOUS SOMMES, DISIEZ-VOUS, SANS CONTESTE, BEAUCOUP ECARTES DE LA CHARTE CES DERNIERES ANNEES. NOUS SOMMES PERILLEUSEMENT PROCHES D'UN NOUVEL ETAT D'ANARCHIE INTERNATIONALE''. ET UN PEU PLUS LOIN VO

Available in two packages:

- **SOFTWARE ONLY**
  Apple, Commodore 64, Microbee – **$25.00**
- **FULL PACKAGE – software & pc board.**
  Apple, Commodore 64, Microbee – **$35.00**

Both packages include full instructions for building the Listening Post project and application notes for your computer.

Send to: "AEM Listening Post Software", 1st Floor, 347 Darling St, BALMAIN 2041 NSW.

*You must include a blank C10 cassette or **formatted** disk.*
Please Tick.

☐ *Software Only*
☐ *Full Package*

☐ Microbee – Epson FX80/100 printer
☐ Microbee – C.Itoh 8510 printer
Microbee: ☐ 5¼" and ☐ 3½" disk

☐ Commodore C64/128 (most printers)
Commodore: ☐ 5¼" disk or ☐ cassette

☐ Apple (most printers)
☐ 5¼" disk ONLY

☐ Cheque ☐ Money Order
☐ B/Card ☐ M/Card ☐ Visa
(make cheques or money orders payable to "Australian Electronics Monthly")

Card No ..... Expiry .....
Signed .....
Name .....
Address .....
.....
..... P/Code .....

Regd Address:
1st Floor, 347 Darling Street, Balmain, NSW. 2041

IONOSPHERIC SUMMARY

The Ionospheric Summary from IPS Radio and Space Services contains the following information for the month of September.

The monthly averages were:
10 cm Flux — 152.4
Sunspot Number — 120.8
A Index — 10.4
I Index — 110.3
Flares — 10.

Solar activity was moderate during the month with a total of 10 M class flares observed. Much of this solar activity occurred at the end of the month during the period September 25-30. The largest flares for the month were the M7 flares on September 27 and the M6 flares on September 28.

The 10 cm flux continued the trend of recent months by varying considerably in the course of the month. A high of 189 occurred at the start of the month while another peak was reached in September at a value of 180. Overall, the monthly averaged flux value was 152.4 which is vary similar to that of the previous two months. The monthly averaged sunspot number was 120.8, the highest value for this solar cycle. The flares occurred with two on September 8, one on September 19, 22, 25, two on September 27, and one on September 28, 29 and 30.

The geomagnetic field was active to minor storm levels until 1500 UTC on September 1, after which time the disturbance subsided to unsettled conditions. There were periods of active conditions again during the first half of September 2. The geomagnetic field became disturbed after 0000 UTc and was at storm levels after 0900 UTC on September 11 and continued into September 12, and the disturbance declined during the day.

The field became active early on September 17, and remained disturbed until the end of September 19. There were intervals of storm conditions between 0000 and 0600 UTC on September 18, and 0600 and 0900 UTC on September 19.

The field was disturbed throughout September 21. As is common during the Equinox periods, geomagnetic disturbances were more common during September than has been the case over recent months. The most disturbed day was September 11 when the A index reached a value of 33. September 18 was also quite disturbed. High solar flux during the month meant that MUFs on HF circuits were mostly high. The geomagnetic disturbance on September 11 could have produced some difficulties in HF propagation.

All indications are that the current cycle will be very large, and may well usurp Cycle 21, for the place of second highest on record. The benefits that a large solar cycle brings, unfortunately can be accompanied by more frequent disturbances to circuits due to solar-induced shortwave fade-outs.

Apart from the field of communications, a large solar cycle may also produce other benefits. One of these comes from the small increase in ultraviolet radiation that accompanies increasing solar activity.

Another benefit of a large solar cycle is too clear out some of the unwanted artificial space debris that is currently circling in low Earth orbit. Of the 7000 pieces of material currently tracked in orbit, only five percent represent operational satellites. Hopefully, a large Cycle Number 22 will help to further remove unwanted items from this man-made reservoir of potentially lethal projectiles.

—Compiled by Frank Hine VK2QL from IPS Radio and Space Services Data

ar

WICEN News

ST JOHN/WICEN EXERCISE (BICENTENNIAL DISASTER)

Paul Walton VK3PW
PO Box 106, Mitcham, Vic. 3132

The proposed plans for a joint exercise had been laid-down for months but no one in WICEN knew what was going to happen or when — just as it had been planned. Colin Smith VK3AKQ, of St John Ambulance was asked to create a scenario for an exercise whereby WICEN Region 13 call-out procedures and preparedness for an activation could be tested to the full. It was!

Col's restrictions were that the exercise should be held on a weekend in October or November with allowances made for any prior commitments to other exercises by WICEN. To test the willingness of our members to participate, Col stretched the friendship by electing for a call-out date of October 2 — Bathurst race day and the last day of the Olympics.

A call to the Region Co-ordinator, Paul VK3PW, at 10 am on the Sunday morning saw Col requesting assistance from WICEN to provide communications facilities to St John as their radio network had collapsed. Initial requirements were for stations at St John Headquarters, in Melbourne, two in Region 13 at Ringwood and Diamond Valley, and for one station in Region 28 at Rosebud. These stations were located at Pony Club Meets. Messages were to consist of situation reports, general traffic and a few "Furphys" for good measure.

Gwen and David Tilson, VK3DYL and VK3UR, received the next call with directions to establish a base station at their house to begin the ringing of all WICEN members. Parallel calls were made by Paul to other leaders and administration staff. State Co-ordinator, Leigh VK3CDP, was informed of the need for other regions to become involved and the possible escalation of requirements around the State. At the end of the day requests had been made for stations at Rosebud, Camperdown, Winton Raceway, Avenel, and Pyramid Hill, near Kerang. Locally the call-out produced 20 members from Region 13 to handle the net establishment and the stations at Melbourne, Ringwood and Diamond Valley with other members on standby in the event that the situation worsened.

A debriefing was held with some of the participants resulting in many constructive ideas evolving from the discussions. In answering previous questionnaires, members had indicated they could be ready to leave on an activation within 30 to 60 minutes of receiving a call-out, but that in practice had found that the equipment wasn't always where it had been assumed to be when put to the test. Answers to newer members on message and net handling techniques were not always forthcoming, prompting another night meeting to discuss these topics. With the recent printing of the VK3 Operator's Manual many of these subjects should be more confidently handled in the future.

Overall, the exercise was deemed very successful by both WICEN and St John prompting the thoughts of holding another one this year (not Bathurst weekend!). Thanks must go to all who participated, especially those country regions who didn't even know the event was to be held, and to Col and St John for organising the exercise. Let us hope with the coming fire season all WICEN members ask themselves the question — how prepared am I?

ar

HOW TO JOIN THE WIA

Fill out the following form and send to:

THE MEMBERSHIP SECRETARY
WIRELESS INSTITUTE OF AUSTRALIA
PO BOX 300
CAULFIELD SOUTH, VIC. 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

Call Sign (if applicable): .....

Address: .....

.....

State and Postcode: .....

Silent Keys

It is with deep regret we record the passing of:

MR E BRAND	**VK2BXV**
MR ERIC K CHIPPINDALL	**VK4XR**
MR DAVID W COHEN	**VK3CWC**
MR F J EVANS	**VK2XFE**
MR J C FIELDS	**VK3ANU**
MR J N FULLER	**L20038**
MR D A NORMAN	**VK3UC**
MR TOM SOUNDY	**VK2ETS**
MR G C R WATERS	**VK3AWV**

HAMADS

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 millimetre SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

COAXIAL RELAYS: 110VAC 24VDC, BNC-N-BNC $38. Valves: 6146B (GE) $40.60. 6JS6 (GE) $30.20. 8950 (GE) $34.80. EC 8010 (for HP608E) $39, and many more . . . D. Dauner, 51 Georges Crescent, Georges Hall, NSW. 2198. Ph: 724 6982. Telex: AA 178 401.

RADFAX2: Hi-Res radio facsimile Morse & RTTY program for IBM PC/XT on 360K 5.25" floppy + full Doc. Need CGA, input port, SSBhf FSK/Tone decoder. Has re-align auto-start view save print. Also "RF2HERC" same as above but suitable for Hercules card and "RF2EGA" for EGA card (640X350 mode). Programs are $30 each + $3 postage ONLY from M Delahunty, 42 Villiers Street, New Farm, Qld. 4005. Ph: (07) 358 2785.

WANTED — VIC

MAGAZINES: Do you have any spare copies of AR magazine. The Federal Office needs the following to complete our files. All of 1963. All copies prior to 1955. Please forward details to WIA Executive Office, PO Box 300, Caulfield South, Vic. 3162.

HELP! Information wanted on your attempt to receive the 10 kHz pulse originating from North West Cape, WA. Richard Burden VK3FKB, 50 Tamar Street, Bayswater. Vic. 3153. Ph: (03) 729 7149.

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

✲ Eight lines free to all WIA members, ninth line for name and address. Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.

✲ Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment. (A courtesy note will be forwarded that the ad has been received and will appear in . . . . . issue of AR.

✲ Copy in typescript, or block letters to PO Box 300, Caulfield South, Vic. 3162

✲ QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

STATE : .....

MISCELLANEOUS ❑

FOR SALE ❑

WANTED ❑

Name and Call Sign: .....

Address: .....

Phone Number (if applicable): .....

WANTED — QLD

CRYSTAL-LOCKED: 2m xtal locked or tunable tcvr. Price to VK4FX, QTHR. Write or ph: (071) 71 3968.

KR500, 2C39, 8122 BASE: 2300 MHz converter. 12mm fixing "N" socket. Xtal between 44.5 MHz and 44.6 MHz. 94 MHz xtal superflex N male & female connectors. VK4TL, 16 Kambara Street, White Rock, Qld. 4871. Ph: (070) 54 3677.

SYSTRON DONNER SERVICE MONITOR: type R1200. Any condition. Reply to VK4AO, 41 Spencer Street, Iluka, NSW. 2460. Ph: (066) 46 6587.

WANTED — WA

MICROPHONE: Original factory microphone for Yaesu FTDX-400. Specifications for G5RV wire antenna & any other wire antennas. Terry VK6NTJ, QTHR.

FOR SALE — NSW

FREQUENCY METER: BC-221-T & Calibration book with built-in AC power supply. $20. AR 1983-84-85-86-87 $10 the lot. Old ARRL Handbooks 1937-1945-1950-1960, Antenna Book 1944, Radio Handbook 9th Edition (1942), 73 Dipole & Long Wire Antennas. Any reasonable offers. All articles plus freight/postage. Alan VK2AHR, QTHR. Ph: (064) 95 9275.

ICOM IC-04AT: as new in box. IC-4E, IC-40 from $300. Also Icom CT-10 computer demod, NP too 4 radios $400. All excellent condition. Don VK2EYI. Ph: (02) 627 3669. **Licenced amateurs only for transceiver.**

KENWOOD TR-7950 2M FM TCVR: 45W 21 memories. $525. Kenwood KPS10 power supply $225. As new ideal for base or high power mobile station. VK2XFE deceased estate. Ph: (02) 449 3135.

POWER SUPPLY: 25 amp peak power. Master home-brew 13.8 volts, never used. $200. 2 metre 7 element Yagi. Home-brew 10 dB gain 1.2:1 VSWR over whole band. Never used, tested only with excellent results. Icom 04A H/H 70 cm tcvr. Used only once. All accs, etc. $375. Jim VK2KAX. Ph: (043) 41 7693.

SHACK CLEAROUT: Transceivers — Yaesu FT-207R 2 metre hand-held $225. Wilson WE-800 2 metre portable/mobile $275. Philips FM321 70 cm mobile $200. Weston HF-1000 28/27 MHz hand-held $40. Antennas — 10 metre quarter wave mobile whip $25. 40 metre helical mobile whip $35. Roof rack with ball mount $15. Printers, VDU kits, keyboard, crystals, etc. Gareth VK2ANF. Ph: (02) 981 1395.

SWAN 700CX POWER SUPPLY: Muffin instruction book. Very good condition. $500 negot. Oscar Block perfect $70. VK2SU. Ph: (069) 68 1556.

FOR SALE — VIC

COMPUTER: Pioneer PX7. MSX Instr Manuals. 18 copies Computer Forum, 1 copy. The MSX Book. All mint cond. $160 the lot. VK3BAX QTHR. Ph: (052) 9 7401 after 7 pm.

KENWOOD TS-940 HF TRANSCEIVER: includes auto ATU & general coverage rx. $3700 ONO. Brand new (still in box) never been used. Owner transferred overseas. John. Ph: (03) 794 8077 BH or (03) 232 6587 AH.

FOR SALE — QLD

BELCOM LINER 432 MHz SSB/CW TRANSCEIVER: $300 ONO. Drake SSR1 comms receiver. 0.5-30 MHz $150 ONO. Kenwood TS-120V HF SSB tcvr, suit novice. Digital readout $500 ONO. 2 AR245A 5W 2m FM hand-helds with telephone touch-tone keypad. Nicads included but no charger. $600 ea or $1000 pair. Never used. Inspect at 379-391 Middle Road, Greenbank, Qld. 4124. Ph: (07) 800 6798 AH.

DICK SMITH HORNET CB: converted to cover 28.245-28.685 MHz, 40 channels with slider. Very good condition $150 ONO. Also, RTTY modem for VZ200/VZ300 computer. Works well. $50 ONO. Steve VK4KHQ, QTHR. Ph: (077) 43 4508.

ICOM 430 MHz LOW NOISE PREAMPLIFIER: New, never used. Still in orig box. Freq range 420-450 MHz. Gain 15 dB. Power requirement 9 to 15V DC. Maximum feed thru RF 15 watts. $70. Brian VK4ATQ. Ph: (07) 374 1008 AH.

STOLEN EQUIPMENT

Kenwood two-metre FM VHF transceiver, Model TR-7850. Serial Number M 2020561. This unit was stolen from the University of NSW Campus, Sydney on Saturday, October 22, 1988.

Any reader with information about this unit please contact the Maroubra Police Station (02) 349 9224, the owner Les Kirchmajer VK2ALK, or your local police station.

ar

Advertiser's Index

THE NEW ICOM IC32AT, OVER. WITH ITS DUPLEX FACILITY, OVER. MEANS YOU WON'T HAVE TO TALK LIKE THIS, OVER AND OUT.

The IC32AT is the newest dual band handheld transceiver by Icom.

It has been designed with the most advanced VHF technology the electronics industry can offer.

And this little 2 metres and 70cm compact handheld offers full duplex facility.

Which means instead of a broken conversation, you can now simultaneously transmit on one band and receive on the other. Just like a telephone conversation.

No longer do you have to wait for a long "Over". It's full "Break in".

And with its high output power, you can be sure your words are heard. The IC32AT uses a custom designed power module as the final amplifier. Which means this transceiver puts out 5.5W on 2 metres and 5W on 70cm.

So you will never be at a loss to make that repeater.

What's even more incredible, each of the twenty memory channels can store two frequencies: operating frequency and offset frequency are just a couple of examples.

The Programmed Scan function scans all the frequencies between two programmable scan edge frequencies, while the Memory Scan function scans all memory channels in succession, except, of course, those you lock out. In short, you can scan 2 metres, 70cm or all channels.

Thanks to the handy little pocket beep, you'll never miss a call. By installing the UT-40 Tone Squelch Unit (sold separately) the transceiver functions as a pager.

You can use the built-in DTMF keyboard to access a repeater and to make a phone patch. The key numbers and letters are printed large for quick and easy reading.

As for monitoring the input frequency when you work a repeater, that's as simple as pushing the Monitor switch on the side panel to open the squelch and check the frequency.

Every five seconds, Priority Watch monitors the Call Channel, or one or all the memory channels in succession.

And that's while you operate!

When you want to change the frequency or the memory channel fast, the Dial Select changes the 1MHz, 100kHz digit or the memory channel directly. One push of the button does it.

All these functions not only make the Icom IC32AT the most advanced dual band handheld transceiver available, but also very easy to use.

Call (008) 338 915 for your nearest Icom stockist today.

The telephone conversation in itself will be a very good demonstration of the IC32AT's duplex facility.

Over and out.

ICOM

The Ball Partnership ICO 0024